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Index to Contents, see Page XI.
Index to Advertisers, see page IX.
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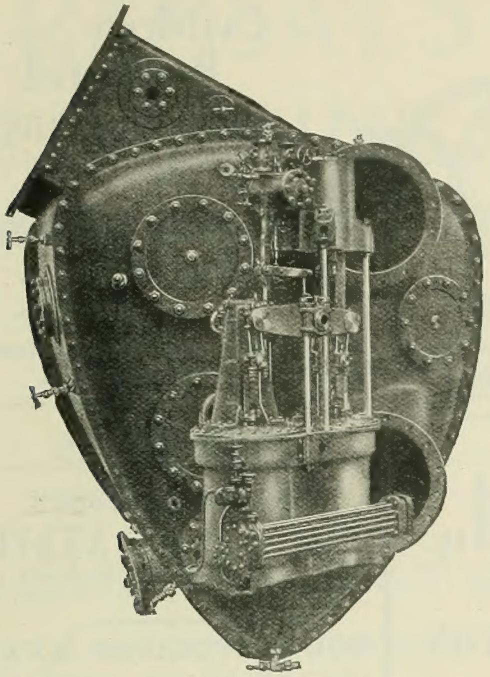

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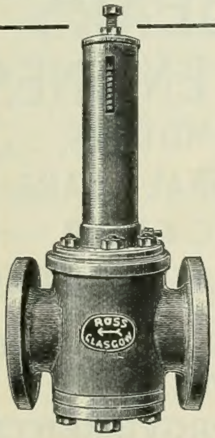

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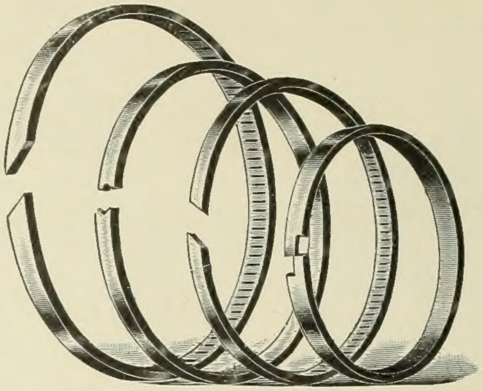

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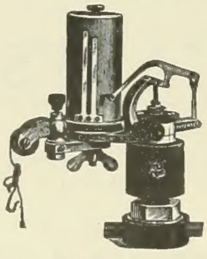

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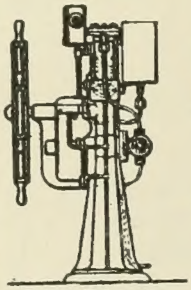

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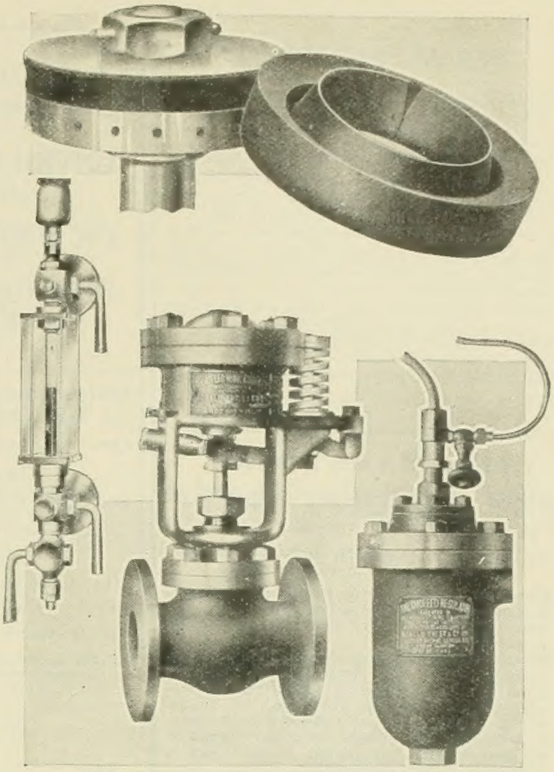

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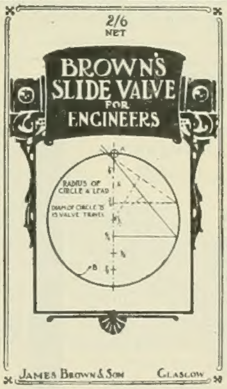

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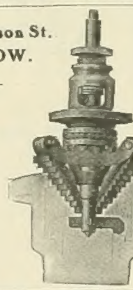

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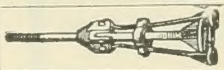

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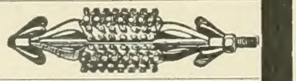

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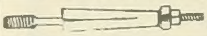

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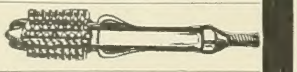

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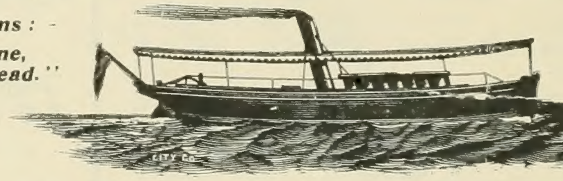

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INDEX TO ADVERTISERS.

For Classified Index see page v.

	PAGE
Alexander, E. P., & Son	i
Anderson, D., & Son	xiii
Anglo-Swedish Electric Welding Co., Ltd.	xi
Ashwell & Nesbit, Ltd.	
Aspinall's Patent Governor Co.	x
Atlas Metal and Alloys Co., Ltd	i
Auld, David, & Sons	xix
Bailey, Sir W. H., & Co., Ltd.	
Bassett-Lowke, Ltd.	xix
Battle, A. E.	viii
Beldam Packing & Rubber Co., Ltd.	i & xxiv
Béliard, Crighton & Co.	
Bennett College, Sheffield	ix
Bremner, John A., & Co	xvi
Briggs, W., & Sons, Ltd.	
British Arc Welding Co., Ltd	vii
British Oxygen Co., Ltd.	xix
British Westinghouse Electric & Mfg. Co., Ltd.	xiv
Bromell Patents Co., Ltd.	viii
Broughton Copper Co., Ltd.	i
Brown Bros. & Co., Ltd.	iv
Brown, James, & Son	vii
Bruce, R. T., & Co.	ii
Bull's Metal & Melloid Company, Ltd.	xi
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Cape Asbestos Co., Ltd.	
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Cochran & Co., Annan, Ltd.	
Cohn, M. B.	i
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McLean, Hugh, & Son	xx
McNeil, Chas.	ix
Metallic Valve Co.	xv
Miscellaneous	
Moseley, D., & Sons, Ltd.	i
Mosses & Mitchell	viii
North-Eastern Marine Engin. Co., Ltd.	xv
Pacific Steam Navigation Co., Ltd.	
Patents	ix
Potts, W. J.	viii
Ramsay's Marine Engineering Co., Ltd.	v
Reed, Thomas, & Co., Ltd.	vi
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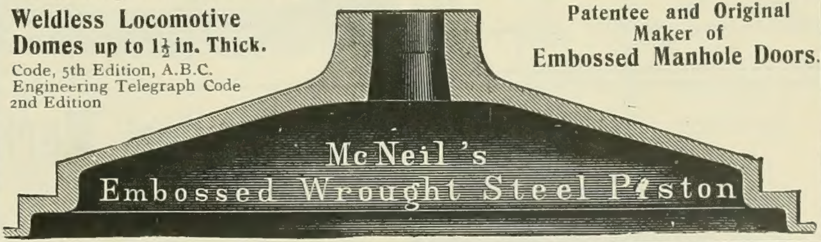

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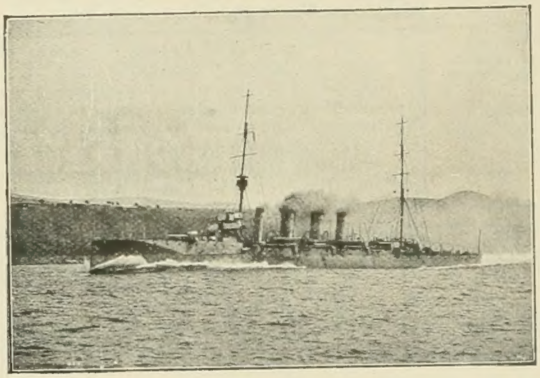

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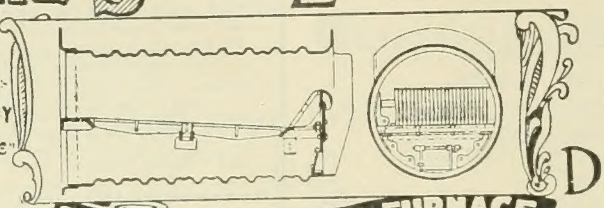

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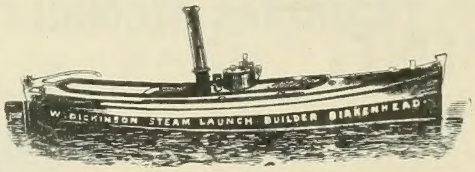

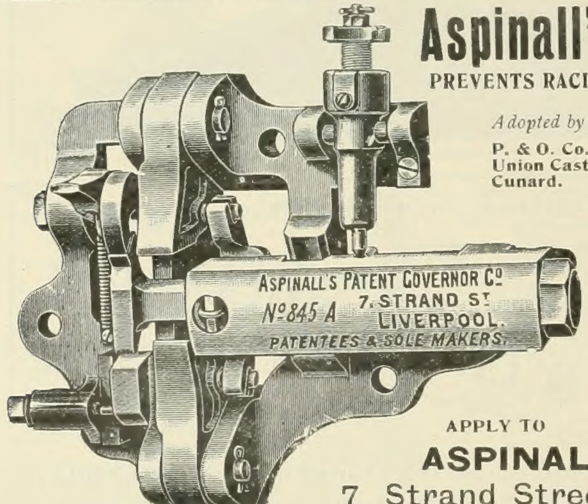

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CONTENTS.

	Page
EDITORIAL NOTES—	
The *Olympic-Hawke* Appeal	117
The Loss of the *Rohilla*	117
The Electric Super Dreadnought	118
RESOURCEFUL ENGINEERS	118
REPAIR SHIPS AND THEIR DUTIES (*Illustrated*)	119
NAVAL MATTERS—PAST AND PROSPECTIVE	123
LIVERPOOL ENGINEERING SOCIETY	126
FLEETS OF THE MAIN LINES	128
DIESEL ENGINES	132
BRITISH WRECKS	134
PRESENTATION TO SIR JAMES MILLS, K.C.M.G.	134
CAPTURE OF ENEMY SHIPS	135
INDUSTRIAL AND TRADE NOTES	136
MESSRS. R. T. BRUCE & CO.	137
DRIVING STEAM HAMMERS	137
CORRESPONDENCE	137
REVIEWS	138
WEBSTERS LIMITED	138
LAUNCHES AND TRIAL TRIPS	139
BOILER EXPLOSION ENQUIRY	143
ABRIDGMENTS OF NEW PATENTS (*Illustrated*)	144

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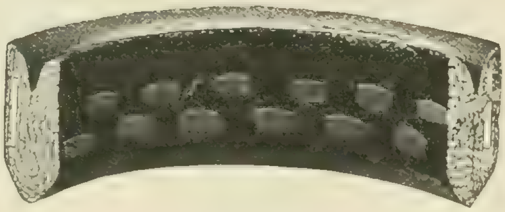

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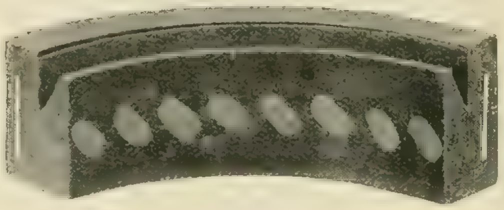

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The Marine Engineer

And Naval Architect.

LONDON, DECEMBER, 1914.

THE *OLYMPIC-HAWKE* APPEAL.

WE have now had the judgment of the highest tribunal of the land as to the responsibility of the collision between H.M.S. *Hawke* and the White Star liner, *Olympic*. This case has created much interest, has given the Courts much trouble, has cost a great deal of money and has involved nautical and legal points of considerable importance. The House of Lords has, by its judgment, finally settled the matter in the same direction as the Admiralty Court and the Court of Appeal, so that it is satisfactory in the main that the three Courts are unanimous, *viz.*: that the *Olympic* was solely to blame, and the case was dismissed. In order to appreciate the salient points of the judgment, and in view of the time that has elapsed since the collision took place, it may be well to set out the facts in chronological order. Before doing so, we may express how pathetic it is that so recently the *Hawke* was torpedoed by a German submarine, and although her loss as a naval unit may be considered negligible, the loss of men is irreparable. Dealing now with the facts. In broad daylight the White Star liner *Olympic*, having a tonnage of 45,000, left Southampton *en route* to New York, and after leaving Southampton Water had to pass round the Bramble Bank towards the eastward of the Isle of Wight, on a S.E. course, she was under a port helm to get into the eastward course towards Spithead. During this turning movement, H.M.S. *Hawke* came up the Solent on a N.E. course with the Isle of Wight close on her starboard, and to get also on to the Spithead course had to starboard her helm. Each vessel got on to her new course and steadied, the *Olympic* heading S. 59 E. and the *Hawke* S. 74 E. Their courses thus converged at an angle of 15 degrees, the *Olympic's* starboard side being open to the *Hawke's* port side. These courses were kept, and when the vessels were close to one another the stem of the *Hawke* was level with the bridge of the *Olympic* on the starboard side of that vessel. At this time the *Hawke* swerved to port and struck the *Olympic* on the starboard quarter, with the result that both the vessels were badly damaged, the fore foot of the *Hawke* being knocked off by the impact. The position of the collision was varied in the course of the case as the fore foot of the *Hawke* was found subsequent to the hearing of the case by the President of the Admiralty Court. The main charge of the *Olympic* was that the *Hawke* was the overtaking vessel and ought to have kept out of the way, while the case of the *Hawke* was that she was never an overtaking vessel, that the ships were on crossing courses, that it was the duty of the *Olympic* to keep clear, that she took too big a sweep round the Brambles and came too near the *Hawke*, causing the latter to swerve towards and into collision with the *Olympic*. The Lord Chancellor, after reviewing the evidence, came to the conclusion that the *Hawke* was a crossing ship within the meaning of Article 19 of the Collision Regulations and not an overtaking ship within the meaning of Article 24. It was therefore the duty of the *Olympic*, which had the *Hawke* on her starboard side, to keep out of the way, the duty of the *Hawke* being under Article 21, to keep her course and speed. He also came to the conclusion that the collision was caused by the force of an interaction resembling suction in its effect between two vessels. In the case of a vessel as large as the *Olympic* the forces of interaction might have operated at a distance of 100 yards, and in the view taken by his Lordship the two vessels might have been as close as that.

THE LOSS OF THE *ROHILLA*.

THE lessons of the war which are being forced upon the nation are many and serious, and among them are such that lead one to think of the lack of appreciation of the necessity of providing simple and effective means of reducing, if not wholly preventing the loss of life in the event of a maritime disaster within a short distance of the shore. The facts in the loss of the *Rohilla* are illustrative of this point of view. It seems that the vessel, which had been fitted out as a hospital ship, and with a complement of 229 persons, was on a southward cruise in the North Sea, proceeding to Belgium to receive wounded. When off St. Abb's Head the weather, which was bad, became worse, and the shore lights having been reduced in number, the captain found himself much nearer the shore than he thought he was when off Whitby. It is stated that subsequently the ship struck a mine, which caused serious damage, and she was run ashore. The work of rescue continued for days and although the majority of the people on board were saved, the large number lost constitutes a terrible death roll. Tremendous efforts were made by the crews of the Whitby lifeboat and the Shields motor lifeboat, and many other gallant people, and no step appears to have been left undone with the means available to reduce the possible extent of the disaster. The point of importance which we desire to draw attention to is the view expressed by Captain Neillson at the inquest on some of his crew. In his evidence the captain stated that it would have been easy to establish communication from the ship to the shore if a rocket apparatus similar to those ashore had been on the ship, and that in his opinion it would be a good thing for ships to carry such rockets. After this expression of opinion it is not surprising that the jury included in their verdict a recommendation that rocket apparatus should be carried on passenger ships. A point that should not be lost sight of, in addition to the possibility of rescuing the largest number of people from a stranded vessel, is the risk or danger attendant on the operations of the rescuers. Consider for a moment the many risks run by the lifeboat men and others in their efforts extending over days and how much of this might have been saved if communication between the ship and shore had been set up soon after the stranding. We believe that the Board of Trade has already approved the principle, but has gone no further. The matter, however, does not unfortunately stop here, for we believe that many of the Naval Reserve men in the Rocket Brigades have been called up to serve in the senior service, therefore the coast protection measures in the times of war are less than in the times of peace, although the necessity of them is much greater, owing to the presence of mines and the other risks of naval warfare. We hope that no time will be lost by the Board in dealing with this important matter, so that those who are risking their lives, particularly in the home waters, may have greater chances of rescue in the event of disaster than they appear to have at the present time, particularly under the conditions of reduced shore facilities, which the existing circumstances of war stress have brought about. The reduction of facilities in one direction necessitates the increasing of them in others.

THE ELECTRIC SUPER-DREADNOUGHT.

We venture to think the news from the United States that the Navy Department at Washington has authorised the statement that the Super-Dreadnought *California* is to be the first electrically-propelled warship, with steam turbines driving dynamos, and a minimum of twenty-one knots, is an announcement of the most profound and stirring interest to electrical engineers, and is a distinct triumph after the strenuous efforts which have been made to bring out the merits of this method of propulsion. To no one can the fact be more pleasing than to Mr. Durtnall, who has for so long and so assiduously attempted to educate the official mind to the potentialities of the electric drive for ships. The U.S.A. Navy Department are not rushing into a gigantic experiment blindfold, as some people might think, because they have been able to make an extended and detailed comparison between the direct steam drive and that in which a generator and motor are interposed between the turbine and the propellor. It is no doubt owing to the results obtained in the fleet colliers *Jupiter* and *Neptune* in which the comparisons were made and to the conspicuous success of the *Jupiter* that the decision as to the *California* was made. The move in this direction of method of propulsion will no doubt bring about other developments which would seem to follow as a matter of course. Among these may be mentioned steering gear, winches and other auxiliary machinery, and lastly and by no means least, gun control. While congratulating the Americans on their enterprise in this direction we may be permitted to express our regret that our Admiralty do not appear to have seen their way to undertake pioneer work of the same character.

RESOURCEFUL ENGINEERS.

A THRILLING incident of the war, as far as the Pacific is concerned, is told in the Melbourne *Argus*, and relates to the escape of the *Southport*, a British steamer of 3,586 tons, built in 1900 for the Lewis Trading Co., from the German island of Kusaie, in the Caroline group, to Brisbane. Captain Clopet, the commander, told the following story on arriving with his vessel off Pinkenba :—

"We were chartered by the Phosphate Company, and left Auckland on June 12th for Ocean Island ; there we were to receive orders. The *Southport* arrived at Ocean Island on June 23rd, and received orders to proceed to Nauru to load phosphates for Stettin. Ascertaining when at Nauru on July 28th that no cargo could be loaded there for at least a month and the weather being unfavourable we decided to go to Kusaie, in the Caroline Islands. We therefore left Nauru on August 1st, steaming slowly, and arrived at Kusaie on August 4th. By this time we were getting short of provisions. We were in the harbour of Kusaie, when on August 14th the German warship, *Geier* arrived and we were seized. A German officer came on board, and informed me that war had been declared between Great Britain and Germany, and he seized all the ship's papers. Our flag was hauled down, and the German flag hoisted for half an hour, while the Germans read a proclamation to me that my ship had been seized in the name of the Kaiser. They did not put me or any other member of my crew on parole. The *Geier* was followed by the German merchant steamer *Tsingtau*, of Bremen, and this steamer eventually came alongside the *Southport*. To prevent us putting to sea they removed nearly all the eccentrics and other parts of the machinery, and took away the main stop valve.

"An officer of the *Geier* told us that we would have to remain at Kusaie until after the war was over. I pointed out to him that we were short of provisions, and that the natives, on account of a cyclone, were also short of food. The officer replied that there were cocoanuts on the island. The Germans also told me that on second consideration they would not sink the *Southport*, but by removing part of the engines I would be compelled to remain in Kusaie. I pointed out to the officer that my crew would be starved out, and I could not be responsible for what starving men might do on the island. The commander of the *Geier* thereupon gave me an order on King Sigrah to secure supplies of meat and other provisions, stating that whatever I had could be paid for after the war. Besides taking our coal, the Germans on the steamer *Tsingtau* took some of our kerosene oil, and everything they thought would be of use to them. They did not touch our provisions, however, because we had none to spare. It was on Friday, September 4th, that the *Geier* came into port, followed by the *Tsingtau*. On the following Monday the *Tsingtau* took her departure at six o'clock in the morning, and that evening the *Geier* departed, sailing in a south-easterly direction. This course, I think, was a bluff. The Germans would alter their course as soon as darkness set in.

"The *Geier* appeared to leave the harbour in a great hurry. After her departure the engineers on the *Southport* inspected the vessel's machinery, and discovered that the German engineers on the *Geier* had not done their work of disabling the engines as thoroughly as they might have done. All the eccentrics, for instance, were not removed. The engineers of the *Southport*, with great ingenuity, managed to fix up the engines in such a way that we could get steam up on the vessel, and go ahead, but we could not go astern. We were practically faced with starvation, and it was only the splendid work done by the engineers that enabled the *Southport* to get up sufficient steam to go slowly ahead. The *Southport* left Kusaie on September 18th, but before leaving I took on board 350 cocoanuts and about 400 lb. of roots of trees, which the natives were already eating owing to the scarcity of food. At night all lights were extinguished on board the *Southport*, and we kept a strict look-out day and night. Passing the Solomon Islands we had a very anxious time, because we were afraid that the German cruiser would make her appearance. We never saw a vessel, however, until nearing Sandy Cape, when the cargo steamer *Westminster*, from Newcastle, N.S.W., was sighted."

The officers of the *Southport* are :—A. Clopet, master ; John Cooper Dodd, of Cardiff, chief officer ; Varwell Shears, of Brixham, second officer ; Harold Cox, of Highbridge, Somerset, chief engineer ; W. E. Harris, of Newport, second engineer ; Arthur Griffith, of Cardiff, third engineer.

The Royal Navy List is for the future to be published annually, and the first issue will be ready this month. The most important features of the work are its unique records of the war services, honours and qualifications of officers and the commissions and services of ships. This year's number will also contain a special supplement devoted to services during the present war of both officers and ships.

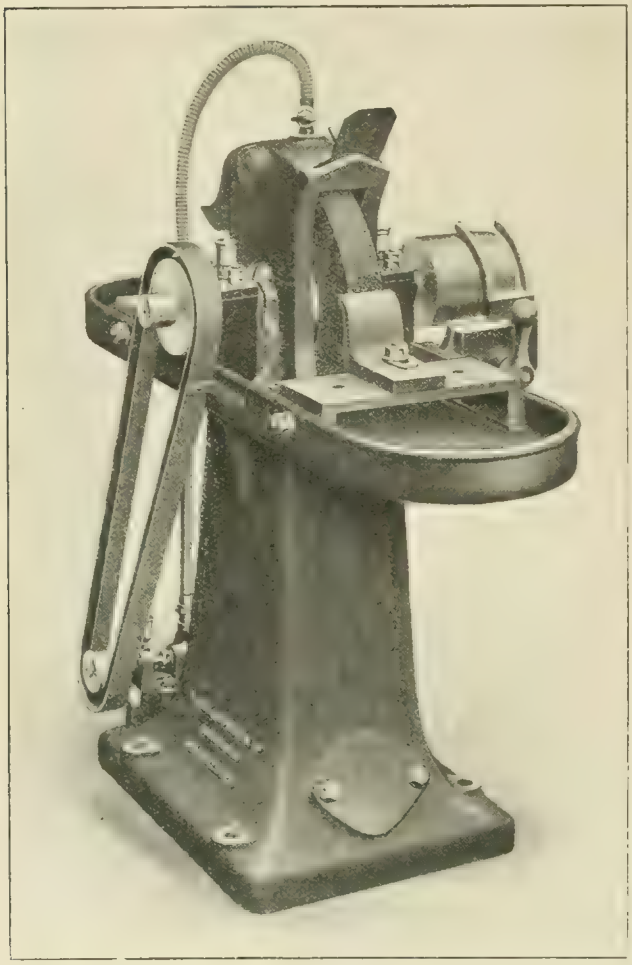
Institute of Marine Engineers.—It is noted that several of the young engineers who contributed essays for the awards competition have enlisted in the country's service, thus showing their stamina and patriotic spirit. Their names and regiments are announced as follows :—Mr. R. J. Walker, Sec. Lieut. Gordon Highlanders ; Mr. A. J. Walker, Mr. C. P. Tanner and Mr. Nicholas Rutherford, The King's Royal Rifles ; Mr. Norman Stewart, assistant secretary, has enlisted for the war in the Seaforth Highlanders, having applied for and been granted leave of absence to join the military forces of the Empire.

REPAIR SHIPS AND THEIR DUTIES

(Continued from page 109).

ANOTHER feature of the fitting shop is the twist drill and tool grinder, by Messrs. Luke and Spencer, Ltd. Drilling machines of various sizes are also fitted, the usual types being the double-geared radials. For small work sensitive drilling machines are fitted. Shaping machines, independently driven, are placed in the heavy machine shop, those by Messrs. Greenwood & Batley, Ltd., being usually adopted. A most important point in connection with the turnery and fitting shops is accessibility, the main idea being, of course, to get the defect on the machine and in hand as soon as possible. All recent repair ships are fitted with rails and gearing for rapid transport of defective parts and finished work, and special hatches are provided leading to the upper deck, to still further facilitate this. In addition to the engineers' workshop just described, special shops are fitted up on the main or lower decks for making good gunnery and torpedo defects, the machinery and general equipment being considerably lighter than that previously described. A most important consideration in the design of any repair ship is the position of the foundry, it being so essential that the ventilation allows of a free escape of the gases, etc. All large repair ships utilise a portion of the hold for the foundry, while in the smaller types it is arranged for on the upper deck. Patent cupolas with a capacity of two tons of iron per hour and combined crucible furnaces for melting metal are fitted in all battle fleet repair ships, while in the smaller ships the Morgan patent tilting furnaces are now almost universally adopted, and experience has proved that these furnaces give excellent results. The illustration on page 107 of our last issue shows the repair ship *Hecla* on which the first Morgan's furnace was installed in a ship of the British Navy. This furnace is of the portable type as shown. Many ships now have plants of one or two furnaces, and this system of melting has also been adopted for home and foreign depôt and dockyard installations. The furnaces on British ships are coke fired, but for ships in which liquid fuel is used Morgan's furnaces are supplied with burners running on air supplied at low pressure, or with compressed air. The usual foundry appliances, such as baking ovens, sand mixers, etc., etc., are, of course, installed. For structural reasons the smithery must of necessity be arranged for in the hold. As in the case of the foundry, ventilation is of the utmost importance, especially in the smaller vessels, where the space is so restricted. Another big factor is that provision must be made so that large machinery parts can be rapidly lowered when required. Another important part of the installation on repair ships is the power-driven hammer made by Messrs. Peter Pilkington, Ltd., for the blacksmith's shop. In some cases the hammer is of the patent self-contained electrically-driven type, in which the hammer and the air pump are combined, the latter being driven by electromotor mounted on the back of the machine, as shown in the illustration. Another type of hammer made by the same firm is the well-known "N.S.K." patent compound pneumatic hammer, operated by compressed air. These hammers are designed for working from the same air compressor which supplies other sundry tools. Messrs. Pilkington's have also supplied a number of planishing hammers for H.M. repair ships, this type of hammer being also operated by compressed air. A steam and hydraulic 75-ton overhung press, made by Messrs. Greenwood and Batley, is also installed. In several repair ships the uptake trunks from the forges are hinged, in order to allow the forges being brought together in the case of a large repair having to be effected. The air for the forges is provided by electrically-driven Root's blowers. Plate-bending machines, capable of dealing with fairly heavy plating, are fitted in the smithery or on the upper deck and considerably add to the usefulness of the repair ship. The coppersmiths' shop is arranged for usually in the hold, and the forges are generally made portable. It is most essential that this shop should be fitted with the most up-to-date appliances, owing to the great number of copper pipes which are always under repair, and all the latest labour-saving appliances are adopted. An interesting machine here seen is the "Kennedy" pipe-bending machine. This most useful apparatus will bend pipes cold without

Combined Tool and Twist Drill Grinder (Messrs. Luke & Spencer, Ltd.).

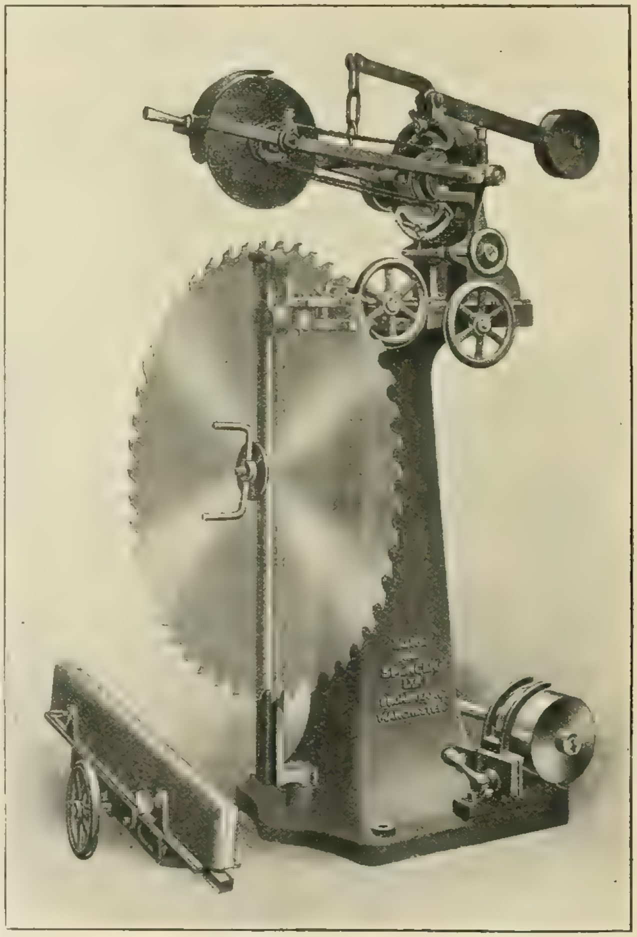


Single Tool Grinder by Messrs. Luke & Spencer, Ltd., Manchester. Many of these machines have been supplied to H.M. Repair Ships.

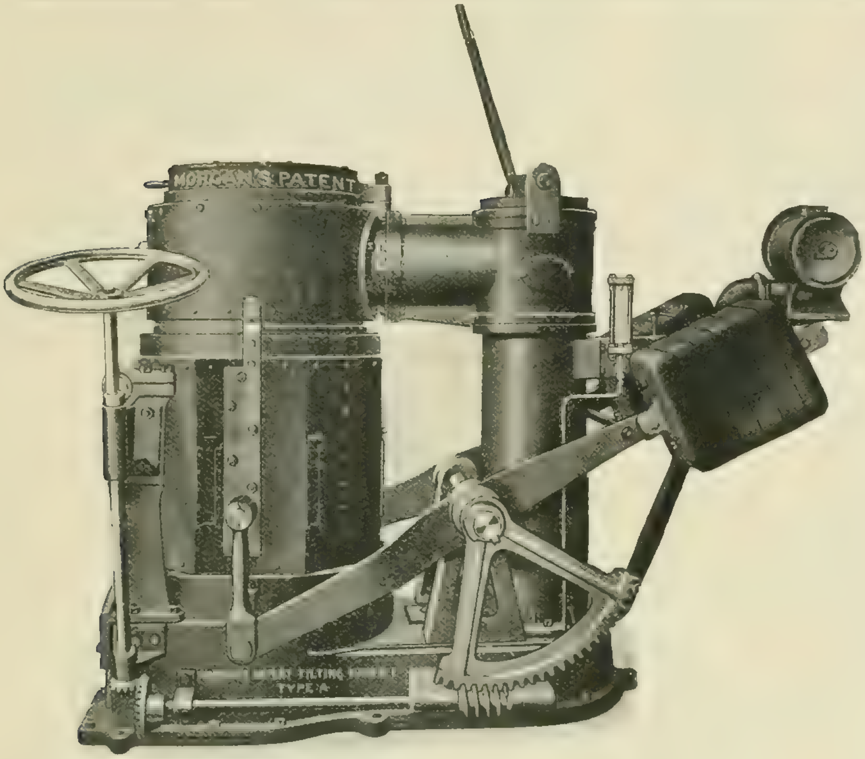
filling to almost any angle desired, and that without any malformation of the pipes. The pattern-makers' shop is arranged for in a convenient spot, usually on the main deck, on account of light. Electrically-driven lathes suitable for the type of ship are installed, and the most up-to-date pattern-makers' tools provided. A most ingenious machine has lately been adopted on all big repair ships and is placed in the pattern-makers' or the carpenters' shop. This machine is the "Wadkin" mechanical wood-worker and is a most ingenious apparatus, patterns which would ordinarily require a lathe can be turned out easily and quickly, and, in addition, much more accurately.

Although, of course, the majority of repairs are in connection with the machinery of the fleet or flotilla, a great deal falls upon the carpenter's staff. He has a special staff of carpenters and smiths to carry out such repairs, and a well-equipped workshop. This workshop is usually arranged for on the upper or main deck and is fitted with motor-driven hand and circular saws, drilling machines, wood planers and the usual small fittings of an up-to-date carpenter's shop. All hull repairs are taken in hand by the carpenter, as are repairs to targets, internal ship's fittings, etc., etc. To further expedite hull repairs, metal punches and shearing machines are installed, usually on the upper deck, and screwing machines are arranged in convenient positions. The saw benches and band saws are by Messrs. Robinson & Son, Ltd.

A notable point in the destroyer and submarine repair vessels is the fact that a large reserve of fresh water is always carried; suitable double bottoms are utilised for this purpose. Very large evaporating and distilling plant is fitted, with a capacity of many hundred tons per day. Pumps and piping are arranged so that the water can be delivered to a boat alongside almost instantly. It must be noted in this connection that the evaporating and distilling plant is of necessity very small in a T. B. D. or T. B., and should a big leak occur in a condenser or boiler, such plant could not efficiently cope with this loss. Again, it must also be remembered that should a leak develop in a condenser, several, if not all of the boilers would salt up, necessitating being emptied and cleaned before being used again. In this case the advantage of being able to obtain a practically unlimited supply of distilled boiler water is at once apparent. In addition to supplying fresh water, should a condenser fail, the defect can be very rapidly carried out, once the boat is alongside the repair ship. Extra artificers would be lent to assist the boat's engine-room staff in



Belt-driven Saw Sharpening and Gullating Machine. This type of machine has been recently supplied to the Admiralty (Messrs. Luke & Spencer, Ltd.).



Morgan Stationary Tilting Furnace, normal position. This type of Furnace has been supplied to the British Navy. (Morgan Crucible Co., Ltd.) (Type A.)

NAVAL MATTERS—PAST AND PROSPECTIVE.

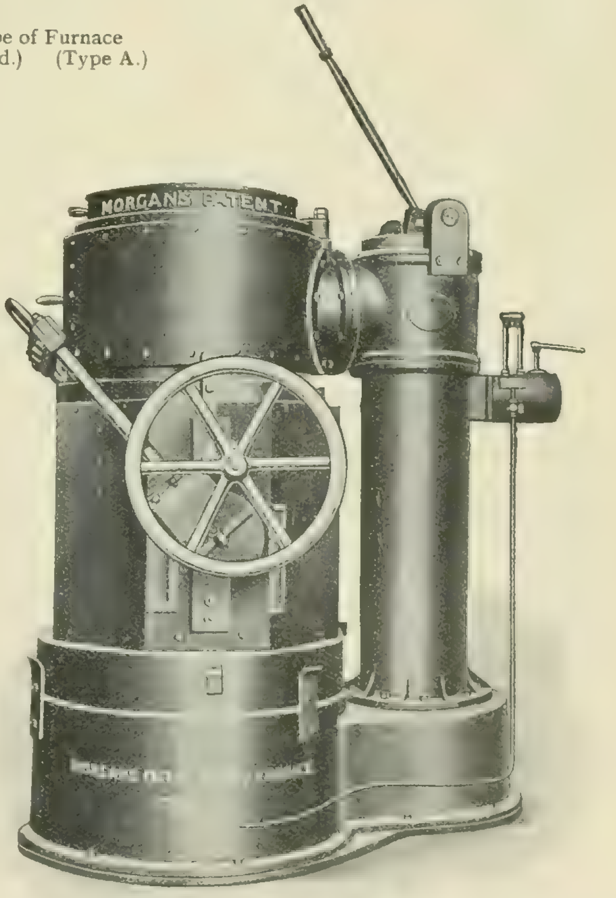
(*From our Own Correspondent.*)

Portsmouth Dockyard.

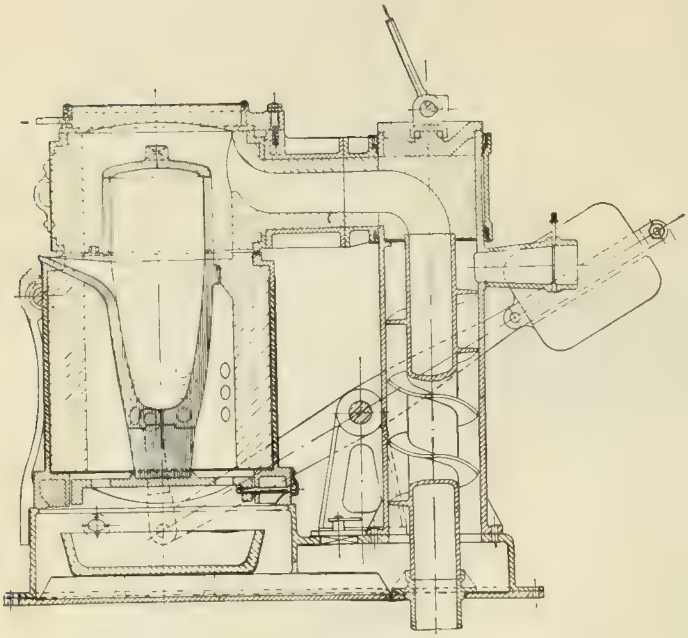
THE first British naval reverse in the war had a particular and poignant interest for Portsmouth, to which Admiral Cradock's flagship, the *Good Hope*, was attached. Many homes are in mourning by the loss of this big cruiser with nearly 900 officers and men, but their relatives have the consolation of knowing that they played an heroic and brave part and gave their lives for their country. "For how can a man die better than facing fearful odds ?" The odds were undoubtedly great, but as the relative merits of the German broadside of twelve 8·2-in. guns and the British broadside of only two 9·2-in. guns, with many similar questions, have already been fully discussed in the papers, it need only be said that the loss leaves the spirit of the Navy absolutely unshaken and will soon be retrieved. Only a week before the battle, or on Sunday, October 25th, the officers of the *Good Hope* sent a cable from Punta Arenas to a Portsmouth outfitting firm reporting all well on board. This cheery news, whose distribution gave such encouragement to the families of its senders, turned out to be the last message received in England from the ship and her gallant crew. The *Good Hope*, it may not be generally known, was a reserve ship here before war broke out, and was sent into the West Atlantic after mobilization. There Admiral Cradock moved into her from the *Suffolk*, and she proceeded south, passing the Magellan Straits on October 1st. That she and the *Monmouth*, also a mobilized ship, would be surprised by the biggest and best German ships outside the waters of Europe was not anticipated for a moment, though the Admiralty may have expected something of the kind, judging by their action in sending out the *Canopus*. Submarine *E*3, the first to go down in this war, also belonged to Portsmouth, as did *D*5, destroyed by a mine dropped by the Germans in their attempted raid on Yarmouth. Fortunately, we have better and bigger vessels now completing, which will replace them. The old gunboat *Niger*, torpedoed off Deal, was a familiar figure at Portsmouth, where for years she had been tender to the torpedo school. She is the second of her class to fall a victim to German mines and submarines, the other being the *Speedy*. In neither case, however, were the crews lost, which points the moral of the present phase of the war. So long as the German Fleet keeps its ports, and Admiral von Tirpitz pursues a submarine and mine-laying policy with vigour, a few British vessels, mostly old and slow craft, are bound to be torpedoed now and then. Hence the crews know what to do and are fully prepared to look out for themselves. With the aid of rafts, and the swimming collars now served to every ship, the chances are that the proportion of men picked up by other vessels will, as a rule, be a high one. The Fleet's loss in material can always be made good within a short time, thanks to our unparalleled resources, but a loss in *personnel* is different.

Devonport Dockyard.

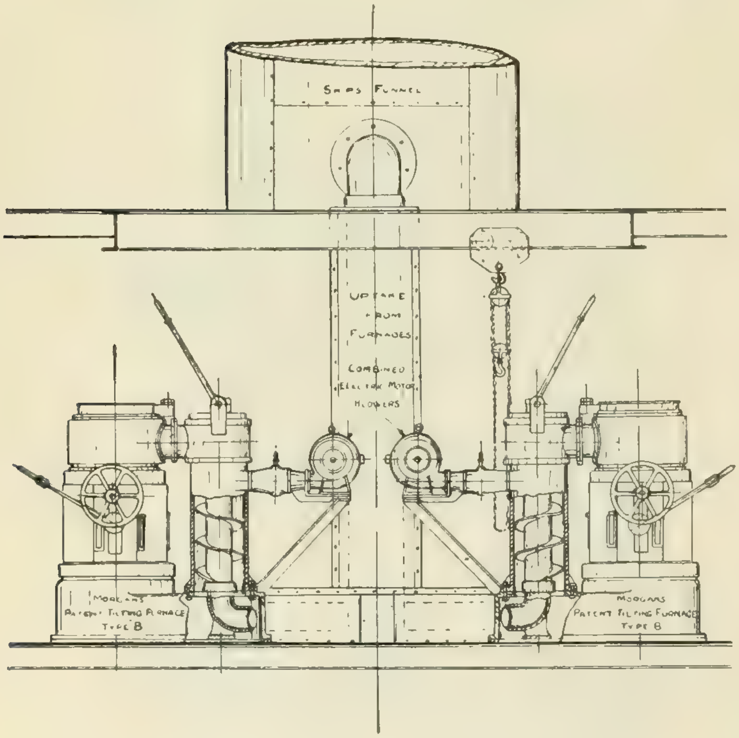
The Troubridge court-martial, over



Morgan's Portable Tilting Furnace as fitted on the Repair Ship *Hecla* and other ships (Morgan Crucible Co., Ltd.). The *Hecla* was the first ship of the British Navy to be supplied with a Morgan Furnace. (Type B).

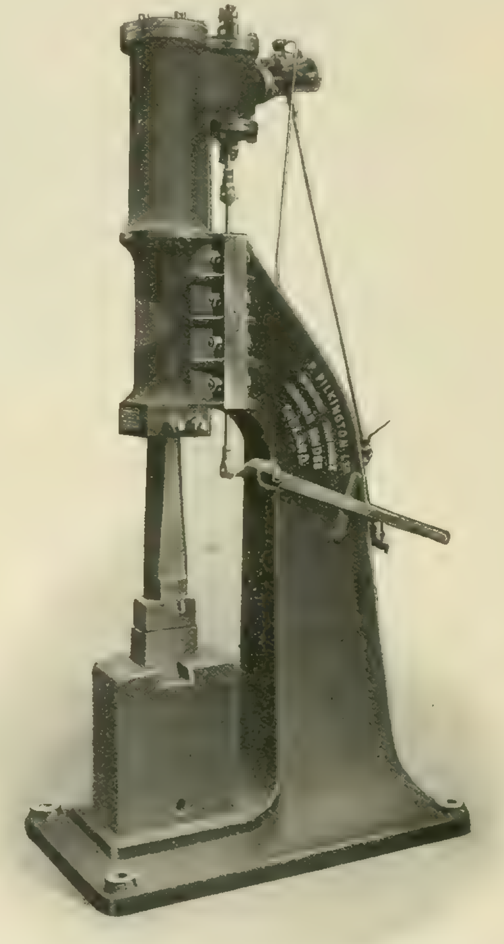


Sectional View of Morgan Tilting Furnace, showing salamander crucible stand, muffle ring spout cover, muffle ring cover and arrangement of regenerative flue. (See "Repair Ships and their Duties")


Ships Funnel
Uptake from Furnaces
Combined Electric Motor Blowers
Morgans Patent Tilting Furnace Type B
Morgans Patent Tilting Furnace Type B

Arrangement of Two Type B, portable Morgan Furnaces for use on board ship. Melting plant consisting of two special Type B (deck) furnaces taking salamander crucibles of 200 lbs. (100 kilos) capacity, for melting brass, copper, etc., and cast iron. The furnaces are shown fitted with combined electric motor, fans and special exhaust outlet pipes communicating with a deck flue to the main funnel.

which Admiral Sir George Egerton, Commander-in-Chief at Devonport, presided, had an ending which gave a good deal of satisfaction. The acquittal of the rear-admiral was reassuring to the Navy and the country alike, even though both are at the moment of writing in the dark as to the charge brought forward or the nature of the evidence given. It was quite a new thing for a court-martial to be conducted in private, but then, as the First Lord has said, "this is no ordinary war," and precedents of all kinds are going by the board. This was shown in an apt manner when the *Emden's* career was at length stopped by the *Sydney* on November 9th, and the Admiralty telegraphed to Captain J. C. T. Glossop, of the *Sydney*, to whom belongs the credit for cornering the German cruiser and bringing her to action, that Captain Carl von Muller and his officers were to be accorded the honours of war and allowed to retain their swords. In the old days, it would have been for the senior naval officer on the spot to decide whether this should be done or not. Various changes in commands and appointments have occurred during the past month, especially among captains. The command of the Devonport training establishment *Impregnable* has passed to Captain Philip Streatfeild, formerly of the War College, from Captain F. G. St. John, who has taken command temporarily of the *Undaunted* and the Third Destroyer Flotilla, owing to the illness of Captain Cecil H. Fox. The last-named gallant officer was evidently too zealous in going to sea again so soon after his terrible experiences when his former ship, the *Amphion*, was destroyed by a mine, the explosion of which rendered him insensible on the bridge. On recovering, his first thought was to get the engines stopped, after which it was impossible to reach the bridge again owing to fire. We have now a new Assistant King's Harbourmaster



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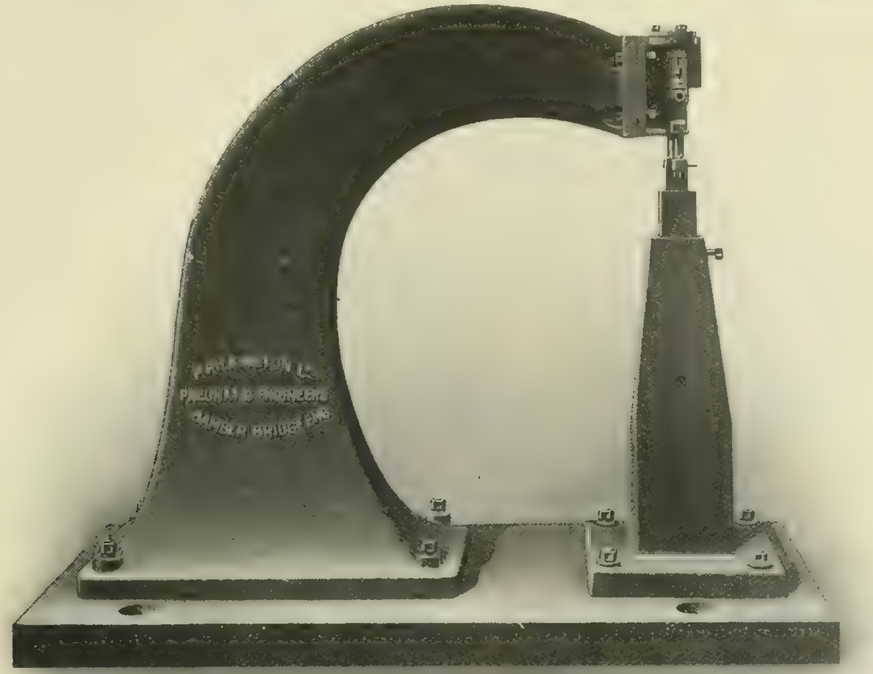

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in the person of Captain G. P. E. Hunt, a retired officer whose career is well known. He was originally in the merchant service, and entering as a Supplementary Lieutenant in October, 1895, he had the luck to be in the cruiser *Forte* on the Cape Station during the Boer War, and was landed in charge of two 4·7-in. guns for the Natal Naval Brigade. As "Brigade Major, Quartermaster and Chief of the Staff all rolled into one," said Captain E. P. Jones, his services were invaluable, and he was mentioned in General Buller's despatches and promoted. He only retired last year on reaching the age of fifty, after having commanded the cruisers *Ariadne*, at Portsmouth, and *Newcastle*, in China. His example is one which should inspire many other officers of the mercantile marine now on active service with a determination to make the most of their opportunities in the war.

Chatham Dockyard.

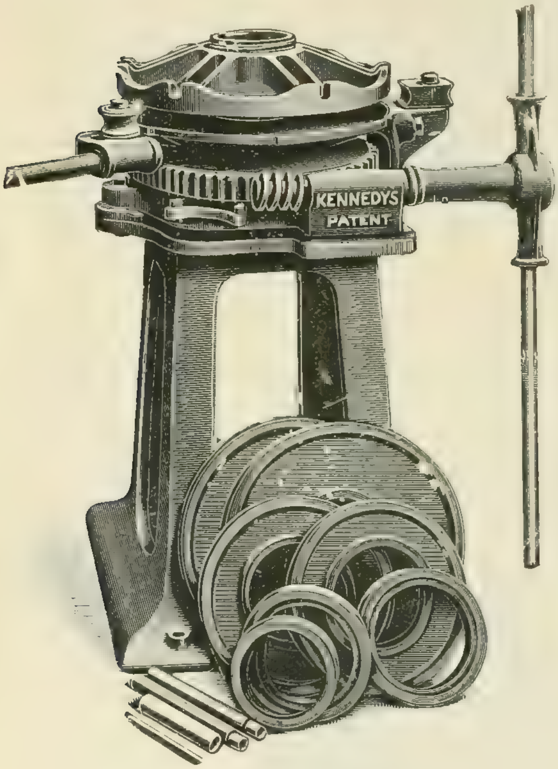
The publication of the despatches for the Heligoland battle on Trafalgar Day caused great interest at Chatham, to which the damaged ships returned for repair and on which many of them were based. There were many congratulations of the fortunate recipients of D.S.O.'s and other distinctions. The promotion of three of the lieutenant-commanders came quite as a surprise, and has been the subject of some discussion. While no one begrudges them their advancement, which is recognised as having been well-earned, the question is asked whether these promotions are to be regarded as additional to those which will be made in accordance with custom on New Year's Day. If not, there is likely to be some heart-burning among the lieutenant-commanders in the general service, who by the nature of the conflict so far have had no opportunity to distinguish themselves. The Army in the field is different in so far that a much higher proportion of its *personnel* can get a chance of going into action, opportunities being more numerous and evenly distributed. The main strength of the Navy, however, upon which everything depends in the last resource and which is going to win this war, has not yet been called into action, owing to the inactivity of the German Fleet. It seems rather premature, therefore, to regard promotion as a means of rewarding the submarine and destroyer officers who alone up till now have been able to do much fighting. There are other ways of recognising their services without prejudicing the prospects of the officers in the Grand Fleet. At least, this is the view one hears expressed at present, and characteristically the action of the authorities is ascribed to the enthusiasm of the First Lord for the newer forms of naval warfare. Another feature of the despatches and their accompanying honours was the neglect of the engineer branch. Four engineer lieutenant-commanders were mentioned by Commodore Tyrwhitt for coolness and resource, three of whom carried out repairs under fire. None of them, however, received further recognition at the hands of the higher authorities, although eighteen commissioned officers were rewarded altogether, nine being in the destroyers, five in the submarines, and four in the air-craft. The officers

3-cwt. belt-driven Power Hammer, by Messrs. Peter Pilkington, Ltd., as supplied to a large number of Repair Ships.

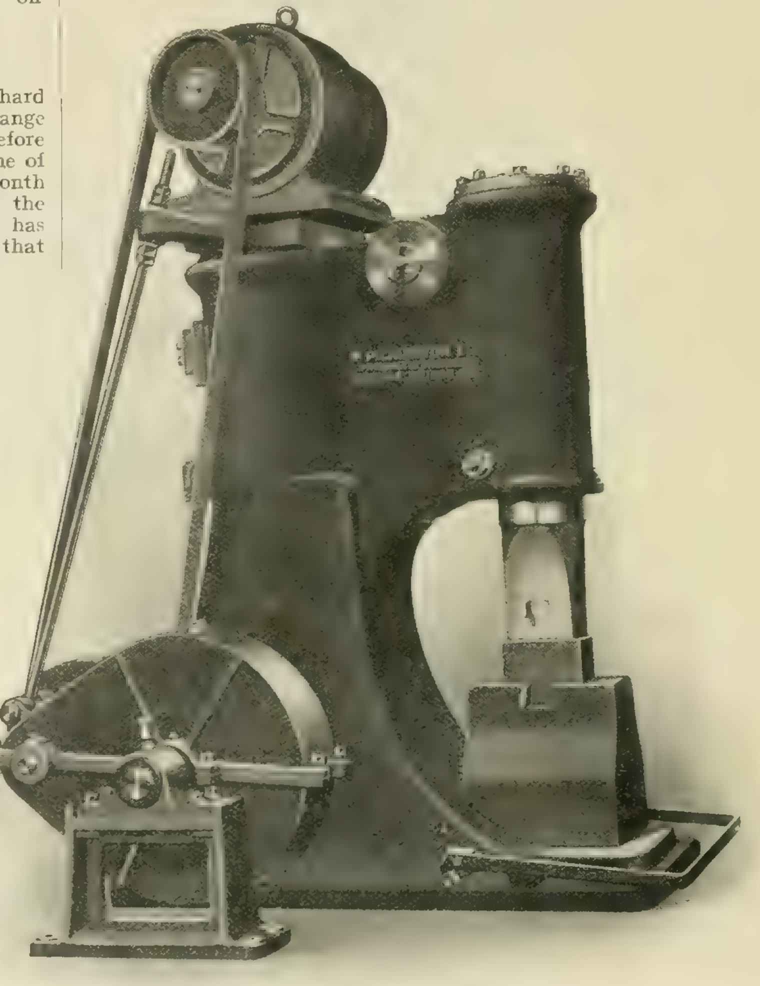
referred to were Engineer-Lieutenant-Commanders C. de F. Messervy, of the *Fearless*; Alexander Hill, of the *Laertes*; E. H. T. Meeson, of the *Laurel*, and F. A. Butler, of the *Liberty*. The events of the past month have not been exceptionally striking, and in the yard progress has been most satisfactory, which is all that can be said under present conditions. Another cruiser has been chosen to serve with the naval airmen in place of the *Hermes*, which was caught by a submarine while returning from Dunkirk to Dover on October 31st, happily with small loss of life.

Sheerness Dockyard.

Another busy month has gone, and looking back it is hard to define its chief events. Things do not have time to arrange themselves in their proper perspective during a war before other happenings crowd upon them. Undoubtedly some of the most important naval happenings during the past month have been those off the Belgian coast. The work of the heterogeneous collection of ships under Admiral Hood has been magnificent and wonderful when it is remembered that at the outbreak of war this flotilla did not exist. No one could have foreseen the likelihood of warships being called upon to stem the tide of a German military invasion of Belgium. Yet a large force, very suitable for the work required of it, was soon ready when the need arose, and without weakening the ordinary fleets and squadrons. The most notable units in the flotilla were the three ex-Brazilian "monitors." Their crews have had some strenuous weeks, firing off thousands of rounds of high explosive shell into the German lines and trenches with telling effect, with only a few intervals for the guns to cool, or to return for minor re-adjustments. The howitzers in these vessels have more than proved their worth. It was on October 18th that the Navy first took a hand in helping its comrades on land. Nine days later, the fire of a battleship's guns was brought to bear by the arrival of the *Venerable* off the coast. The cruisers assisting have included the *Brilliant*, an old vessel brought back on to the effective list, while there have been many destroyers, including the *Myrmidon*, and *Falcon*, the latter of which has lost her commander, killed in action, Lieutenant-Commander H. O. Wauton. The sloops *Rinaldo* and *Wildfire*, which were only used for instructional purposes before the war as tenders to the gunnery schools, also took on a new value by reason of their light draught, and joined up with Admiral Hood's flotilla. The Air Department, to which reference has already been made in this column, has rendered useful service to the flotilla in spotting and correcting the range of the guns.



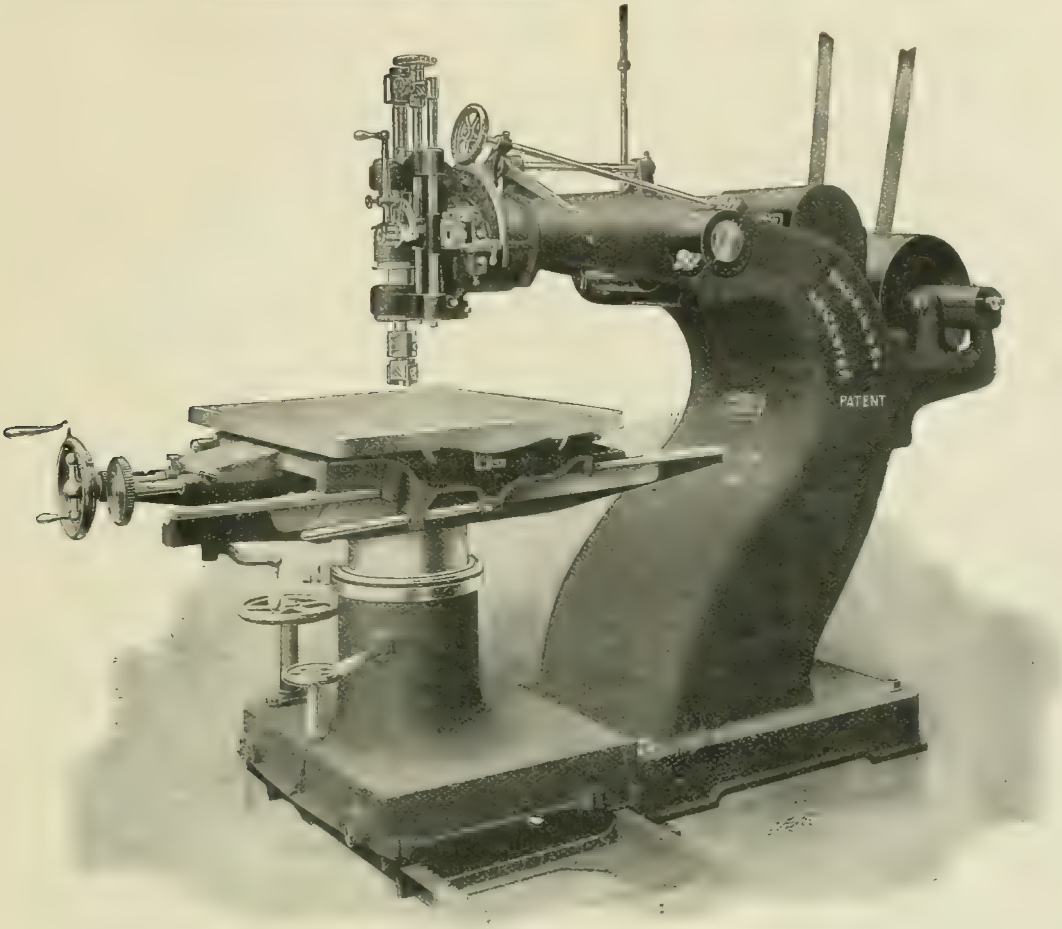
The Kennedy Pipe-bending Machine, as supplied to H.M. Repair Ships (Mr. W. Kennedy, West Drayton).



The "Pilkington" Self-contained, Electrically-driven Pneumatic Power Hammer for Repair Ships.

LIVERPOOL ENGINEERING SOCIETY.

At the opening of the 1914-15 Session of the Liverpool Engineering Society, in November, Mr. Ernest C. Given, M.I.C.E., M.I.Mech.E., M.I.N.A., said that a considerable number of papers dealing with various branches of Engineering had been arranged for, which he hoped, would be of interest to the members. He was proud to say that many of their younger members had answered the nation's call to arms, and their Honorary Secretary and Honorary Treasurer had also donned the King's uniform. He asked that a full list of all the members of the Society who had joined the Forces be made and recorded in the Minutes. He paid a tribute to the



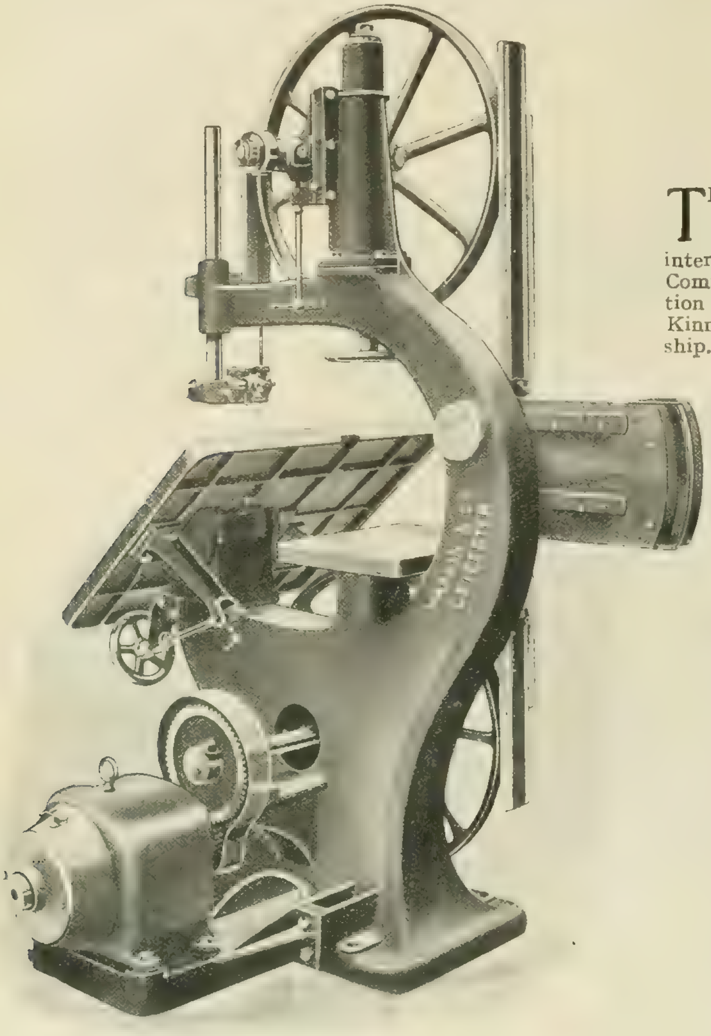
Mechanical Woodworker, by Messrs. Wadkin & Co., Ltd., of Leicester Fitted in a large number of Repair Ships, including H.M.S.'s *Cyclops* and *Assistance*.

The machine is shown arranged for belt drive.

work of the Royal Engineers and to the engineers who had designed and built the magnificent fleet which had done such excellent work and was now carrying out its ceaseless watch in the North Sea. After urging British engineers to be on the watch to obtain their share of the orders, which must be placed later owing to the destruction of road and railway bridges, and to the cancellation of orders for iron and steel previously placed on the Continent, Mr. Given, in dealing with the systems of transmission, said that some members would remember the old system of gearing employed on some of the early steamers to increase the revolutions of the propeller over those of the slow-moving steam engine and the great relief that was felt when the system (involving frequent renewal of wooden teeth for the gears) was abandoned, and yet to-day we were being asked to again adopt gearing, although now it was for the purpose of reducing the revolutions of the propeller from those of the high speed steam turbine, but what a difference in the gearing! That now offered was machine-cut helical steel gearing of ample surface, running in an oil bath and usually singing a song of contentment as it worked. Some might favour the electric system of transmission which eliminated all the shafting between engine room and the after recess, and yet reverse the propeller with the go-ahead turbine. Some might favour the hydraulic system of transmission, which, like the other two systems, enabled reduction of speed between the high-speed turbine and the propeller, and which, like the electric system, enabled the propeller to be reversed whilst being driven by the go-ahead turbine, whereas the gearing system necessitated a go-astern turbine. If one favoured high-speed turbines, one of the above systems had to be chosen. If, however, one preferred moderate-speed turbines for high-speed multiple screw ships, the alternative of combining turbines with reciprocating engines had to be considered, and if one were considering vessels of moderate horse-power, trading on fixed routes where oil is available, one had to consider the internal combustion engine.

It was of interest to note that the month of September on the Clyde showed a number of these types fitting out. The list included an Atlantic twin-screw reciprocating engined liner; an Eastern twin-screw reciprocating engined liner; the first Atlantic liner to have geared turbines; the first Atlantic liner to have no fires aboard, but Diesel engines; the twin-screw steamer, which is to have as sister ships three geared turbine liners, and a geared turbine coasting vessel.

The case of three steamers, the *Bandon*, the *Pangan* and the *Chumpon*, which had their steam engines and boilers removed, and each had two sets of six-cylinder 1,600 b.h.p. engines fitted, was of much interest, and caused some curiosity when new vessels were built for the removed engines and boilers, but when it was stated that the three older vessels were of a special type for light draught work, and the weight of the Diesels was less than the steam plant, whereas the new hulls were built for a different trade, the mystery disappeared. This



The Wadkin 36-in. Band-sawing Machine, as fitted in H.M. Repair Ships. (Messrs. Wadkin & Co., Ltd., Leicester.)

went to show that though the marine engineer was faced with difficulty in arriving at a choice of the best form of power plant in each case, the naval architect also was faced with a variety of alternative methods of construction, and had to choose the best suited for each case. Similarly all through the different branches of their profession this was a day of great responsibility in choosing the best system or method for each undertaking, carefully balancing the mechanical efficiency with the commercial and financial aspect constantly before one, and as these responsibilities grew greater yearly, so did the necessity for sound education founded on first principles, and carried to higher levels than past generations considered necessary, involving more years at school and college and in training to fit an engineer for the great burden and make him better able when first he goes abroad to stand alone.

Mr. Given concluded by again urging that this was a time when, our chief competitor experiencing a severe check in commercial activities, we should fit ourselves for a better fight in winning and holding the markets of the world.

FLEETS OF THE MAIL LINES.

(*From our Own Correspondent.*)

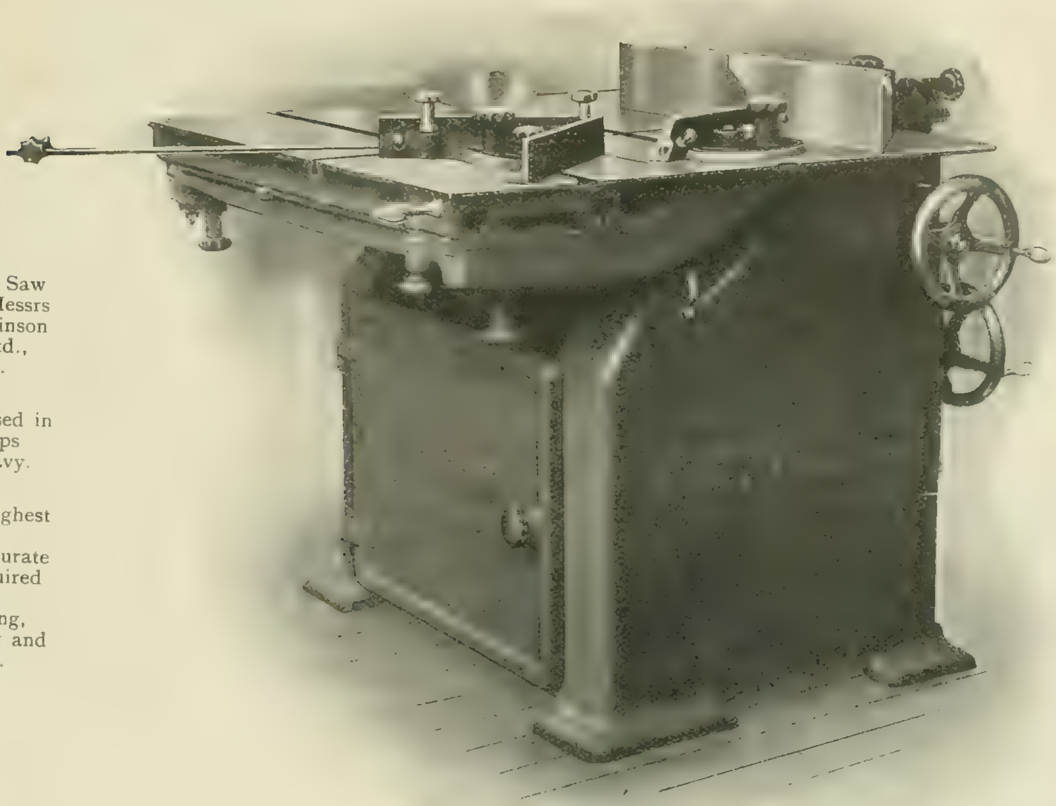
Merchant Shipping and the War.

Escape of the "Ortega."

THE story of the escape of the R.M.S. *Ortega*, of the Pacific Steam Navigation Co., from the attentions of a German cruiser in the Magellan Straits, is very interesting reading, and it is pleasant to know that the Committee of the Liverpool and London War Risks Association have extended their thanks to Captain Douglas Reid Kinneir for his seamanlike skill and courage in saving his ship. The vote was accompanied by a substantial recognition of one hundred guineas. The circumstances under which the twin screw liner *Ortega* escaped were briefly these :—On the 19th September at 11 a.m., being then in lat. 51·23 S., long. 75·57 W., the officer on the watch observed a cargo vessel approaching the ship. Then he found she was in company with another vessel which was signalling to her in German. The second vessel soon proved to be a warship, for she came up at speed and signalled the *Ortega* to stop. The *Ortega*, however, did no such thing. She had already altered her course and those in the engine and boiler rooms were working for dear life, so that the ship was soon making a speed which, though magnificent for a vessel whose trial results did not exceed some 15 knots, was still far inferior to that of the modern German commerce-destroyer. When the *Ortega* was two miles off Cape George the cruiser stopped and fired two shots at the liner. Neither of them, however, got home, and the German turned and went away, obviously hoping that the prey would have eventually to come away and fall into his jaws. But though the Germans are-full of slim ruses and treacherous signals they have not yet probed the possibilities of British seamanship. Captain Kinneir actually took his heavy draught ship inside Cape George and through the unsurveyed waters of the Nelson Straits, an officer in a boat preceding the liner and signalling the depths that were found. Progress was naturally very slow, and anxiety both on the bridge and on the starting platform must have been intense. But the thing was done and the ship got through into Smyth's channel, and never saw the German again. Captain Kinneir thus beat two records—he took a deep draught ship through an unsurveyed and notoriously dangerous channel and he has the proud boast of as yet being the only merchant seaman who has successfully got away from one of these fast pirates, when they have really succeeded in getting within gunshot. At a recent interview Capt. Kinneir spoke highly of the co-operation of his officers, Mr. Ellis Roberts, chief officer, Mr. Stanley Matthews, second officer, Mr. Matthew Armstrong, third officer, Mr. Donald McCutcheon, fourth officer, and gave unstinted praise to the work of the engineers. Mr. Robert Alles was chief and Mr. Wm. Bain, second engineer. At the time of going to press the names of the other engineers were not obtainable.

The "Emden's" Victims.

Two of the German "Town" class have been removed from their sphere of destruction since we last wrote. The *Königsberg* has been shut up in an East African river by H.M.S. *Chatham*, whose draught prevented her from following the German to her destruction. But whilst she waits outside she has blocked the channel by sinking colliers in the fairway. The *Königsberg* is not a ship of which even the Kaiser can be very proud. She sank one British ship, the Ellerman liner *City of Winchester*, in the earlier days of the war, and at a later stage caught the old cruiser *Pegasus* at anchor in Zanzibar Harbour and, firing from a point which the British guns could not reach, disabled her, and then sailed away. The second ship is the famous *Emden*. A complete list of the damage wrought by her should be put on record. All the exploits, it should be explained, took place in Indian waters. These are the vessels she captured and, or, sunk.



Two-spindle Saw Bench by Messrs Thomas Robinson and Son, Ltd., Rochdale.

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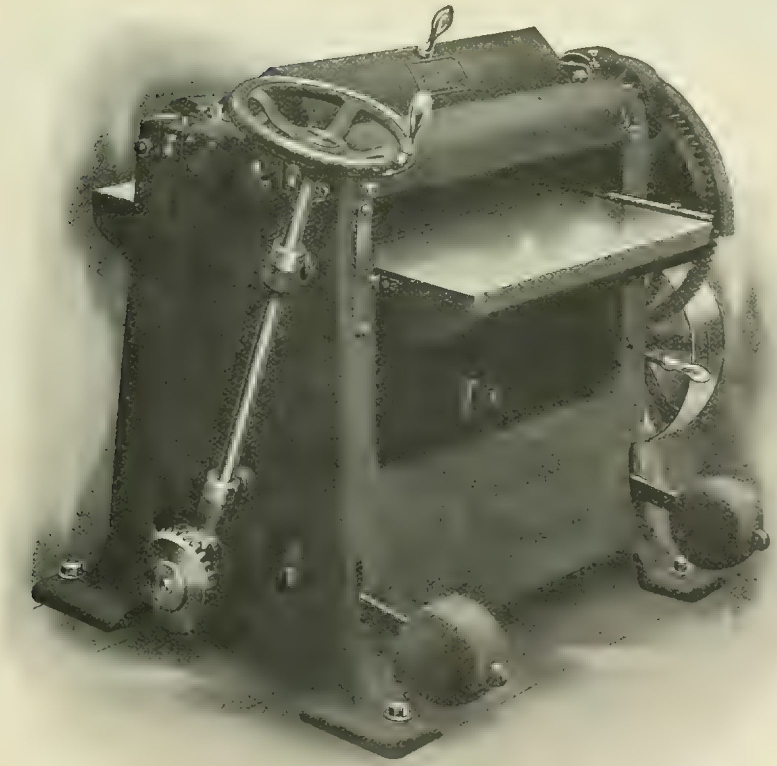

Planing and Thicknessing Machine by Messrs. Thomas Robinson & Son, Ltd., Rochdale

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Machinery made by Messrs. Robinson has been supplied to Repair Ships *St. George*, *Assistance*, *Aquarius*, *Fishguard*, *Tabristan*, *Cyclops* and *Hecla*.

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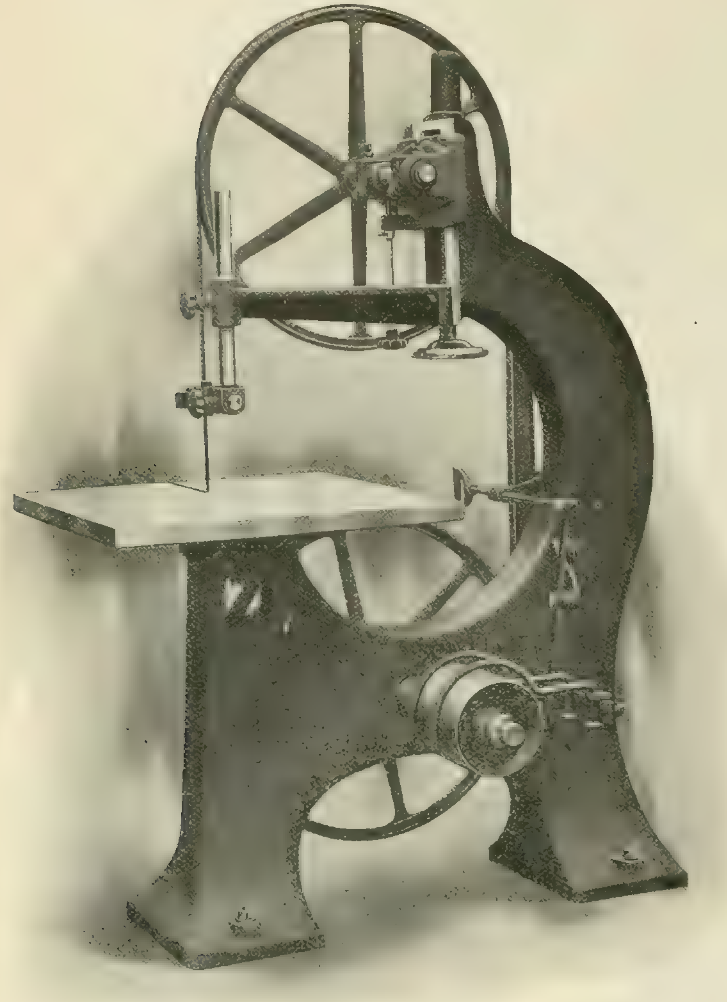
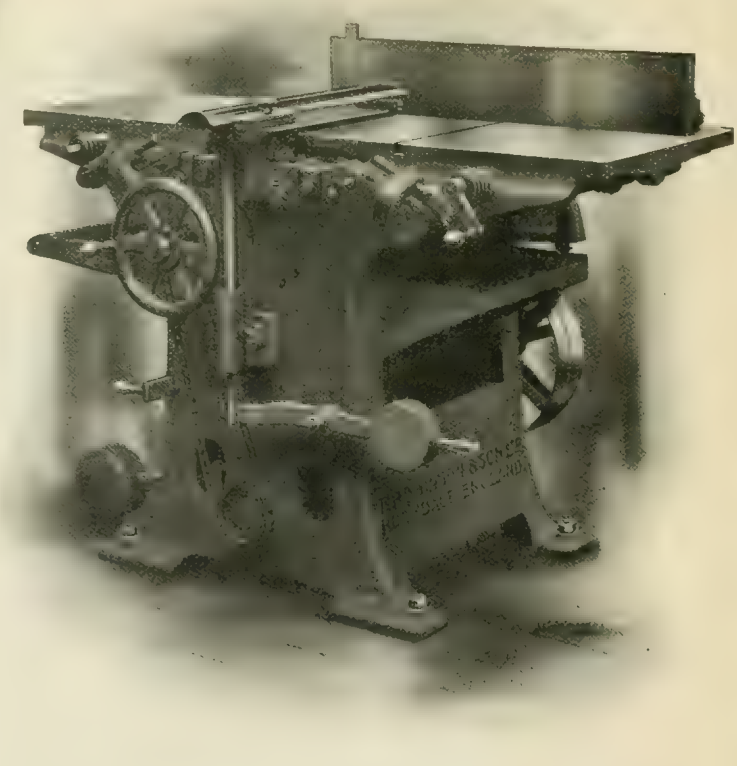


1914, Sept. 10th to 14th.

Ship.	Owner.	Voyage from	Çargo.	Value.	Fate.
Indus	J. Nourse	Calcutta	General	£138,000	Sunk
Lovat	Warrack's	,,	Ballast	60,000	,,
Killin	Connell's	,,	Coal	43,000	,
Diplomat	Harrison's	,,	General	300,000	,,
Trabboch	Kyle Transport	Negapatam	Ballast	20,000	,,
Sept. 12th.					
Kabinga	Captured, loaded with crews from other ships and let go.				
Sept. 14th.					
Clan Matheson	Clan Line			38,000	Sunk
Sept. 30th.					
King Lud	King Line	Alexandria	Ballast	40,000	,,
Foyle	Mercantile Co.	Sfax	Ballast	30,000	.
Riberia	Bolton Line	Alexandria	Ballast	30,000	.
Tymeric	Andrew Weir	Samarang	General	131,000	,
Buresk	Burdick & Cook	Port Said	Coal	52,000	Captured
Gryfedale	Released.				
Pontoporos	Embiricos		Coal		Captured
Oct. 20th.					
Troilus	Alfred Holt	Yokohama & ports	General	680 000	Sunk
Clan Grant	Clan Line	United Kingdom	General	128,000	,
Ben Mohr	W. Thomson	,,	General	163,000	
Chilkana	B.I.S.N. Co.	,	General	212,000	,,
Ponrabbel	Dredger	,,	Ballast	29,000	,
Exford	W. J. Tatem	Cardiff	Coal	55,000	Captured
St. Egbert	Rankin, Gilmour & Co., let go with captured ships' crews.				
Oct. 21st.					
Jemchug	Russian Navy	Torpedoed in Penang Roads.			
Mousquet	French Navy	,, ,, ,,			

It would thus appear that her depredations have cost our mercantile marine about 2¼ millions sterling, a small sum in comparison with the value of commerce borne during the three months of her activities. It was reported late in October that the *Emden* had also sunk the *Kamasaka Maru* while proceeding to Singapore, a Japanese passenger steamer of 1,219 tons and supposed to belong to the Kagoshima Yusen Kaisha, but the accuracy of this report has since been denied.

As regards the above ships it should be explained that the Greek steamship *Pontoporos* was seized and used as a collier till she was again captured and released by H.M. cruiser *Yarmouth* which, about the same time, had the good fortune to fall in with the store ship *Markomannia*, of the Hamburg-American line, also being used by the *Emden* as a satellite. This vessel the *Yarmouth* sank. What became of the *Exford* does not as yet seem quite clear. The *Emden* had an objection to sinking coal-laden ships, as, of course, their cargoes were the breath of life to her. But another coal-laden ship the *Buresk* she kept in her company till the end when, apparently, the cruiser which destroyed the *Emden* had to sink the collier too. The final end of the *Emden* is interesting enough. She made an attack on Cocos Island, where she hoped to do great damage to British property by destroying the wireless installation and the telegraph station. With that object in view she landed some forty-three men by boat. But the British officials were too quick for the enemy. A wireless S.O.S. message was got away, picked up by a heavy cruiser and passed on to the fast new cruiser of the Australian Navy, H.M.S. *Sydney*. Up she came at speed and away went the *Emden* without her landing party. But the *Sydney* was too many for her, and in an hour destroyed her completely. The telegraph people, it may be noted, were not a whit less sharp than their wireless colleagues. Though the instruments were injured the cable remained, and they managed to get some weak signals through to Singapore, where the cable staff on duty were equally smart in bringing into operation a mirror apparatus which enabled them to read the message and so to send plant off at once to remedy the mischief wrought by the Germans. It is to be hoped that due enquiry will be made into the allegations of the master of the New



Combined Hand and Power Feed Planing Machine, fitted in several Repair Ships. (Messrs. Thomas Robinson & Co., Ltd.)

Zealand Shipping Co.'s s.s. *Remuera*. This officer is stated to have reported that he was very nearly trapped by the German cruiser *Karlsruhe*—which is doing in the South Atlantic what the *Emden* did in the Indian Ocean—through the use by that warship of the S.O.S. signal. The idea of using the natural instinct of the mariner to save life—even of an unworthy foe—to lure him to destruction is horrible. If it is not true the statement should have authoritative contradiction. If it is true the fact should be recorded, and published the world over so that mariners may be warned of this danger. Moreover when—as must soon be the case—a British warship ends the career of this pirate, her captain should be treated as such an offender against the laws of decency and honour may deserve.

In regard to the captures by the *Emden* it should be added that it is now asserted that the cruiser was made aware of the movements of the Holt liner *Troilus*—the most valuable prize she took—by means of a message sent off from Kobe by a German merchant resident in that port. The alleged sender of the message is now in custody and it is to be hoped that if the charge is found to be true he will be dealt with by the military authorities as a spy.

The National Line.

At the end of October the announcement was made that the old National Line is to be wound up. In the sixties this line was founded for the purpose of bringing cotton from Southern United States ports to Liverpool, and in the seventies it had a fleet of about a dozen steamers, which were for those days of great size, though their speed was moderate. They were then favourites in the emigrant business and a weekly despatch was made from Liverpool to New York, whilst there was also communication from the Thames to the Hudson. The development of the live cattle business gave the ships of the line a good deal of occupation, and at the beginning of the eighties the Company, being apparently in for a run of prosperity, thought it would go in for a record-breaker to rival the then Guion greyhound *Oregon*. So they ordered a yacht-like vessel from Clydebank. But though the steamer fulfilled the promise of her builders she proved an unfortunate acquisition for her owners. She had to run in the line with the Company's *Egypt*, a vessel of some 4,500 tons, not at all a tempting craft for those passengers to return by who had taken their original passage by the crack ship. Then a fortnightly service in conjunction with the *City of Rome* was tried. But the response was not such as to encourage the owners to refuse an offer for purchase from the Italian Government, who thereupon took over the ship. Adequate provision not having been made for depreciation and replacement the fleet gradually melted away till at one time but a couple of vessels remained. Financial difficulties becoming acute, the line became affiliated to the Atlantic Transport Co., who had financed it. Suggestions of winding up were made from time to time, but there was sufficient opposition to these suggestions to make them impossible. Now, however, it would seem that dissolution will be effected. It is now many years since these vessels left Liverpool and made their headquarters on the Thames.

The Loss of the "Rohilla."

A terrible disaster deprived the British India Line of this fine ship on the morning of the 30th October. At the outbreak of the war the Government, which had long employed her as a trooper—converted the *Rohilla* into a hospital ship. Her final voyage was made from Leith for Dunkirk, to fetch home wounded troops from the front. She accordingly carried a hospital staff as well as her crew—but providentially, as she was on the outward voyage, there were no wounded aboard. Sailing down the unlighted coast of Yorkshire in a heavy gale she struck at 4 a.m. something half a mile to the south of Whitby. At first it was thought that she had merely gone ashore, but from the evidence of her officers opinion inclines to the belief that she first struck a German mine. Anyhow she went on the rocks and the heavy seas at once began breaking her up. Gallant attempts were made to effect the rescue. Nearly all the numerous boats of the *Rohilla* herself seem to have been washed away soon after she struck, though one boat was launched and nearly brought her people to land before she succumbed to the violence of the gale. The Whitby lifeboat made several attempts before it effected the rescue of some of the nurses and doctors, and it was then held to be impossible to send her again. So resort was made to the rocket apparatus. But it was of no avail. At 8.30 a.m. the bows of the ship were broken off and those who remained on board had to take refuge on the bridge. No further attempt by boat could be made at that time and some members of the crew, fearing that the ship would finally go to pieces, jumped overboard, only a few of these being fortunate enough to come ashore alive. At one o'clock on the Sunday morning, however, the Tynemouth motor lifeboat *Henry Vernon* reached Whitby, and at four o'clock a powerful searchlight was installed on the cliffs, but it was not till a couple of hours later that the lifeboat could make her way out of the harbour. At considerable risk, and thanks to the liberal use of oil, she got alongside and took on board the fifty persons who still remained on the ship. These included the master, Captain Neillson, and the chief engineer, Mr. Turnbull. The highest praise is due to Captain Barton, who was in charge of the lifeboat, during her tempestuous voyage of forty-five miles down the coast and her dangerous work alongside the wreck. One of the lessons of the disaster is assuredly the need for making it compulsory for steamships to carry rocket firing plant. Had the *Rohilla* been so furnished it is probable that few, if any, of the seventy persons whose deaths have to be lamented would have failed to reach safety. The motor lifeboat has also shown itself a most valuable addition to the resources of the Royal National Institution. Included in those who so unfortunately lost their lives we have to record the names of Mr. J. Brown, the third engineer, and Mr. Perrin, the electrician.

The Reckless Strewing of Mines

in the open seas by the Germans has resulted in the loss of many merchant ships, British and neutral alike, since the commencement of hostilities. This laying of mines is, of course, contrary to the terms of the Hague Conventions. The loss of the French refugee ship *Amiral Gauteaume* was first attributed to this cause. This vessel, which belongs to the Chargeurs Réunis of Havre, had shipped a consignment of no fewer than 2,500 Belgian refugees at Dunkirk and was on her voyage from that port to Havre, when on the afternoon of the 26th October, the steamer being then in the Straits of Dover, she encountered what was at first thought to be a mine. The vessel was obviously very badly injured and it seemed certain that she would founder. The wretched passengers, whose nerves had been broken down by the atrocities which they had suffered at the hands of the invaders of their native land, were naturally inclined to panic, especially as there was a heavy sea running at the time. Indeed it must have seemed, even to the officers and crew of the ship, that an appalling loss of life might be expected. But fortunately the unexpected happened. The South-Eastern and Chatham Railway Co.'s turbine steamer *The Queen* was luckily crossing from Dover at the time, and, noticing the explosion, hastened to the distressed vessel. The occasion was not one for boat work. There were too many people to be handled, and too little time in which to deal with them, whilst boat work in the rough sea would have added to their terror had attempts been made to transfer them by boat. So by a piece of magnificent and daring seamanship Captain Carey, of *The Queen*, laid his vessel alongside the Frenchman and took aboard the great bulk of the passengers. A few were lost overboard in their terror. But this loss seems to have taken place before the channel steamer got into position. Anyhow the feat was one of which British seamen may be proud, even in these days of constant achievement and self-sacrifice. But the cause of the disaster? It was, as I have said, first thought to be a floating mine. It is alleged, however, and the evidence seems fairly conclusive, that the injury to the *Amiral* was wrought, not quasi-accidentally by a contact mine, but absolutely and entirely deliberately by a German submarine. It should be added that the stricken vessel managed to make port, and her injuries, though severe, will be in due course made good.

Messrs. Furness, Withy & Co.,

whose organization sprang to its present vast dimensions from its small beginnings in West Hartlepool, and who have always retained a close connection with that port, have just made the announcement that they intend to remove their headquarters to the Mersey, and that from the 1st January, 1915, they will conduct their business from Liverpool.

DIESEL ENGINES.

Lloyd's Rules for Construction and Survey.

HEREUNDER we give the principal instructions from the Schedule of Rules, recently issued by Lloyd's Register of Shipping, for the construction and survey of Diesel engines and their auxiliaries on board ship.

In vessels propelled by Diesel oil engines, the Rules as regards machinery will be the same as those relating to steam engines, so far as regards the testing of material used in their construction and the fitting of sea connections, discharge pipes, shafting, stern tubes and propellers.

In cases where the designed maximum pressure in the cylinders does not exceed 500 lbs. per square inch, the diameters of the crank shaft of the main engines are not to be less than those given by the following formula :—

Diameter of crank shaft = $\sqrt[3]{D^2 \times (AS + BL)}$ where D = diameter of cylinder, S = length of stroke, L = span of bearings adjacent to a crank, measured from inner edge to inner edge.

The values of (AS + BL) are as given in the following table :

Table I.

4-Cycle Single-Acting Engine.	2-Cycle Single-Acting Engine.	Values of the Co-efficients.
4 or 6 cyls.	2 or 3 cyls.	·089S + ·056L
8 cyls.	4 cyls.	·099S + ·054L
10 or 12 cyls.	5 or 6 cyls.	·111S + ·052L
16 cyls.	8 cyls.	·131S + ·050L

For auxiliary engines of the Diesel type the diameters may be five per cent. less than given by the foregoing formula.

In solid forged shafts the breadth of the webs should be not less than 1·33 times and the thickness not less than 0·56 times the diameter of the shaft as found above, or, if these proportions are departed from, the webs must be of equivalent strength.

Where no fly wheel is fitted, the diameter of the intermediate shaft must not be less than given by the formula :—

Diameter of intermediate shaft = co-efficient $\sqrt[3]{D^2 \times S}$ where D = diameter of cylinder, S = stroke of piston, and the value of the co-efficient is given by the following table :—

Table II.

4-Cycle Single-Acting Engine.	2-Cycle Single-Acting Engine.	Values of the Co-efficient.
4 cyls.	2 cyls.	·456
6, 8, 10 or 12 cyls.	3, 4, 5, or 6 cyls.	·436
16 cyls.	8 cyls.	·466

Where the stroke is not less than 1·2 times nor more than 1·6 times the diameter of the cylinder, (·735 D + ·273 S) may be taken instead of $\sqrt[3]{D^2 \times S}$.

In cases where fly wheels are fitted, the following value of the co-efficient may be taken for determining the size of the intermediate shaft abaft the fly wheel shaft.

Table III.

4-Cycle Single-Acting Engine.	2-Cycle Single-Acting Engine.	Value of the Co-efficient.
4 cyls.	2 cyls.	·405
6 cyls.	3 cyls.	·400
8 cyls.	4 clys	·409
10 cyls.	5 cyls.	·420
12 cyls.	6 cyls.	·427
16 cyls.	8 cyls.	·461

The diameter of the fly wheel shaft must be at least equal to that of the crank shaft.

The diameter of the thrust shaft measured under the collars must be at least $\frac{21}{20}$ths that of the intermediate shaft. The diameter may be tapered off at each end to the same size as that of the intermediate shaft.

The diameter of the screw shaft must be not less than the diameter of the intermediate shaft (found as above) multiplied by $(\cdot 63 + \frac{\cdot 03P}{T})$, but in no case must it be less than 1·07T, where P = the diameter of the propeller in inches. T = the diameter of intermediate shaft in inches.

The size of the screw shaft is intended to apply to shafts fitted with continuous liners the whole length of the stern tube, as provided for in Section 18, paragraph 3, of the Rules for Engines and Boilers. If no liners are used, or if two separate liners are used, the diameter of the screw shaft should be $\frac{21}{20}$ths that given above.

The diameter of the screw shaft is to be tapered off at the forward end to the size of the thrust shaft.

If the designed maximum pressure in the cylinders exceeds 500 lbs. per sq. inch, the diameters of the shafting throughout must be increased in the proportion of

$$\frac{\sqrt[3]{\text{maximum pressure in lbs. per sq. inch.}}}{500}$$

Where the cylinder liners are made of hard close-grained cast iron of plain cylindrical form, accurately turned on the outside as well as bored on the inside, so that their soundness can be ascertained by inspection, and their thickness at the upper part is not less than $\frac{1}{15}$th of the diameter of the cylinder, they need not be hydraulically tested by internal pressure. If, however, they are made of complicated form, the question of testing must be submitted.

The water jackets of the cylinders and the water passages of the cylinder covers and pistons must be tested by hydraulic pressure to 30 lbs. per square inch, and must be perfectly tight at that pressure.

The exhaust pipes and silencers must be water-cooled or lagged by non-conducting material, where risk of damage by heat is likely to occur. The cylinders are to be fitted with safety valves loaded to not more than 40 per cent. above the designed maximum pressure in the cylinders and discharging where no damage can occur. The air compressors and their coolers are to be made so as to be easy of access for overhaul and adjustment.

In single screw vessels, an auxiliary air compressor is to be provided of sufficient power to enable the main engines to be kept continuously at work when the main compressor is out of action. If the manœuvring gear is arranged so that the engines can be kept continuously at work with some of the cylinders out of action, the auxiliary compressor need only be of sufficient power to enable the engines to be kept at work under these conditions. In twin-screw engines, in which two sets of compressors are fitted, the auxiliary compressor must be of such size as to enable it to take the place of either of the main compressors. If in such engines each main compressor is sufficiently large to supply both engines, a smaller auxiliary compressor will be sufficient. A small auxiliary compressor, worked by a steam engine, or by an oil engine not requiring compressed air, is to be fitted for first charging the air receivers. At least one high-pressure air receiver is to be arranged with connections to enable it to be used for fuel injection, in case the working receiver of either main engine is out of use from any cause.

The circulating pump sea suction is to be provided with an efficient strainer which can be cleared inside the vessel.

Air Receivers.—Compressed air receivers for starting air are to be supplied of sufficient capacity to permit of twelve consecutive startings of the engines without replenishment. Cylindrical receivers for containing air under high pressure, used either for starting or for the injection of fuel in oil engines, may be made either of seamless steel or of welded, or riveted, steel plates.

Quality of Material.—If made of welded, or riveted, steel plates, the ordinary rules regarding steel material for boilers apply, which provide that where welding is employed, either in the longitudinal seams or at the ends, the material must have a tensile strength not exceeding 30 tons per square inch (Section 4, par. 7, Rules for Engines and Boilers). In these cases the welding must be lap welding ; neither oxy-acetylene nor electric welding will be permitted.

In the case of seamless receivers, the rules for material will be the same as for boiler shells, but the permissible extension may be 2 per cent. less than that required with boiler plates.

Tensile and Bend Tests are to be made from the material of *each* receiver. When they are welded or riveted, the tests may be made, and the thicknesses verified, before the plates are bent into cylindrical form. In the cases of seamless receivers, the thicknesses must be verified by the surveyor before the ends are closed in, and at this time the surveyor shall select and mark the test pieces required from either of the open ends of the tube. The test pieces are to be annealed before test, so as to properly represent the finished material. The permissible working pressure for welded or seamless receivers is to be determined by the following formulæ :—

Maximum working pressure in lbs. per sq. inch

$$= \frac{C \times S \times (T-2)}{D} \text{ for thicknesses of } \tfrac{5}{8} \text{ in. and above.}$$

$$= \frac{C \times S \times (T-1)}{D} \text{ for thicknesses below } \tfrac{5}{8} \text{ in.,}$$

where S = minimum tensile strength of the steel material used, in tons per sq. inch, T = Thickness of the material, in sixteenths of an inch, D = internal diameter of cylinder, in inches, C = co efficient as per following table :—Co-efficient 77 for seamless receivers of thickness of $\frac{5}{8}$ in. and above, 69 for seamless receivers of thickness below $\frac{5}{8}$ in.; 54 for welded receivers of thickness of $\frac{5}{8}$ in. and above; 48 for welded receivers of thickness below $\frac{5}{8}$ in.

For flat ends welded into the cylindrical shells, the thickness must not be less than

$$T = \frac{D}{17} \times \sqrt{P}$$

where T = thickness, in sixteenths of an inch, D = internal diameter, in inches, P = working pressure, in lbs. per sq. inch.

The permissible working pressure for receivers made of riveted steel plates is to be determined by the rules regulating the working pressure of boilers. Each welded or seamless receiver shall be carefully annealed after manufacture, and before the hydraulic test. Each welded or seamless receiver shall be subjected to a hydraulic test of twice the working pressure, which it shall withstand without permanent set. Each receiver made of riveted steel plates is to be tested by hydraulic pressure to twice the working pressure for pressures up to 200 lbs. per sq. inch. Where higher working pressures are used, the test pressure need not be more than 200 lbs. per sq. inch above the working pressure. All receivers above six inches internal diameter must be so made that the internal surfaces may be examined, and, wherever practicable, the openings for this purpose should be sufficiently large for access. Means must be provided for cleaning the inner surfaces by steam, or otherwise. Each receiver which can be isolated must have a safety valve fitted, adjusted to the maximum working pressure. If, however, the air compressor is fitted with a safety valve so arranged and adjusted that no greater pressure than that permitted can be admitted to the receivers, they need not be fitted with safety valves. Each receiver must be fitted with a drain arrangement at its lowest part, permitting oil and condensed water to be blown out.

PUMPING ARRANGEMENTS.—The requirements of the pumping arrangements for the various holds, double bottoms or other ballast tanks, etc., are to be the same as required in steam vessels of the same size.

The engines are to be fitted with two bilge pumps, which are to be so arranged that either can be overhauled while the other is at work. In twin screw vessels one bilge pump upon each engine will be approved. These pumps are to be arranged to draw from all compartments. Independent power-driven pumps may be fitted in lieu of these, if desired.

A steam pump, or equivalent power-driven pump, is also to be provided with connections to enable it to draw from all compartments and from the sea. It must be arranged to discharge overboard and also on deck to the fire service pipes. It must have at least one suction to the engine-room bilge distinct from those connected with the bilge pumps, so that it may be used for pumping from the engine-room when the bilge pumps are being used upon other parts of the vessel.

In addition to the above, where water ballast is used, the water ballast pump must have one direct suction from the engine-room bilges. (This is in lieu of the bilge injection required with steam engines.)

GENERAL.—For the ordinary fuel tanks the requirements of Section 49 will apply. The daily service and other separate tanks must be tested, with all their fittings, with a head of water of 12 ft. above their highest points. They must be fitted with air pipes discharging above the upper deck. If they are fitted with glass gauges for indicating the quantity of oil contained in them, arrangements must be made for readily shutting off the gauges in the event of the breakage of the glass, and for preventing any damage from leakage of oil.

Special attention must be given to the ventilation of the engine-room.

If the auxiliaries are worked by electricity, the cables in connection with them must be in accordance with the rules for cables for electric light.

It is recommended that all pipes conveying fuel oil should, as far as possible, be made of steel or iron, rather than copper, owing to the rapid corrosion of copper pipes when using oil containing sulphur.

SPARE GEAR.—The articles mentioned in the following list will be required to be carried, *viz.* :—One cylinder cover complete for the main engines, with all valves, valve seats, springs, etc., fitted to it. In addition, one complete set of valves, valve seats, springs, etc., for one cylinder of the main and of the auxiliary Diesel engines, and fuel needle valves for half the number of cylinders of each machine. One piston complete, with all piston rings, studs, and nuts for the main engines; in addition, one set of piston rings for one piston of the main and of the auxiliary Diesel engine; one complete set of main skew wheels for one main engine; two connecting rods, or piston rod, top-end bolts and nuts, both for the main and for the auxiliary Diesel engines; two connecting rod bottom end bolts and nuts, both for the main and for the auxiliary Diesel engines; two main bearing bolts and nuts, both for the main and for the auxiliary Diesel engines; one set of coupling bolts for the crank shaft; one set of coupling bolts for the intermediate shaft; one complete set of piston rings for each piston of the main and of the auxiliary compressors; one half set of valves for the main and for the auxiliary compressors; one fuel pump complete for the main engine, or a complete set of all the working parts; one fuel pump for the auxiliary Diesel engine, or a complete set of all working parts; one set of valves for the daily fuel supply pump; one set of valves for the water circulating pumps; one set of valves for one bilge pump; one set of valves for the scavenge pump, where lift valves are used; a quantity of assorted bolts and nuts, including one set of cylinder cover studs and nuts; lengths of pipes suitable for the fuel delivery and the blast pipes to the cylinders, and the air delivery from the compressors to the receivers, with unions and flanges suitable for each.

PERIODICAL SURVEYS.—The engines are to be submitted to survey annually, and in addition are to be submitted to a special survey upon the occasion of the vessels undergoing the special periodical surveys Nos. 1, 2 and 3 prescribed in the Rules, unless the machinery has been specially surveyed within a period of twelve months, in which case the annual survey will be sufficient. The boilers, if fitted, are to be subjected to the same surveys as required by Section 19 of the Rules for Engines and Boilers.

Special Surveys.—At these special surveys, the main engines and the auxiliary engines are to be examined throughout, *viz.* :—All the cylinders, pistons, valves and valve gears, connecting rods and guides, pumps, crank, intermediate and thrust shafts, propellers, stern bushes, sea connections and their fastenings, are to be examined. The air compressors are also to be examined. The air receivers are to be cleaned and examined and, if necessary, tested, as provided for in the following paragraph.

Annual Surveys.—The whole of the parts of the engines which the engineers of the vessel open up for adjustment and overhaul should be examined and reported upon. The survey must include, for each main engine, the examination of at least two pistons, two cylinder covers and their valves, two connecting rods and their brasses, both top and bottom ends, two of the main bearings and crank shaft journals, and one of the tunnel bearings. If these are all satisfactory, their condition may be taken as representing that of the other similar parts.

In the auxiliary Diesel engines, a similar course must be adopted, but in this case one of each of the parts mentioned of each engine will be sufficient, if found to be satisfactory. The valve gears of all the Diesel engines should be examined, as far as practicable, without complete dismantling.

The air receivers must be examined internally if possible, and, together with the air pipes from the compressors, must be cleaned internally by means of steam, or otherwise. If the air receivers cannot be examined internally, they must be tested by hydraulic pressure to twice the working pressure at each alternate annual survey, attention being specially given to the welding of the ends and of the longitudinal joints. The pumps and air compressors must be examined and tried under working conditions. If found to be satisfactory, they need not be dismantled.

The manœuvring of the engines must be tested under working conditions.

If the examination reveals any defects, the surveyor should recommend such further opening up as he may consider to be necessary.

Survey of Screw Shafts.—Screw shafts are to be drawn and examined at intervals of not more than two years.

NOMINAL HORSE-POWER OF DIESEL ENGINES.—The following rule is to be used for determining the nominal horse-power of Diesel engines in regulating the fees for their survey, *viz.* :—

$$\mathrm{NHP} = \frac{N \times D^2 \sqrt{S}}{80}$$ in the case of single-acting engines of the 4-cycle type,

$$= \frac{N \times D^2 \sqrt{S}}{40}$$ in the case of single-acting engines of the 2-cycle type, and

$$= \frac{N \times D^2 \sqrt{S}}{20}$$ in the case of double-acting engines of the 2-cycle type

where D = diameter of cylinder in inches, S = stroke of piston in inches in ordinary reciprocating engines, = twice the stroke of piston in the case of engines of the " Junker " type, N = number of cylinders.

BRITISH WRECKS.

THE number and nett tonnage of British vessels respecting the loss of which reports were received at the Board of Trade during the month of October, 1914, and the number of lives lost, are as follows :—

Description.	Number.	Nett tonnage.	Lives lost.
Sailing	16	971	11*
Steam	49	58,779†	123‡
Total	65	59,750	134

* Including three lives lost in a sailing vessel sunk by a mine.

† Including twenty-three steamers of 36,571 tons sunk by German warships and six steamers of 8,722 tons sunk by mines.

‡ Including thirty-one lives lost in steamers sunk by mines.

The above table is a record of " reports received " in the month, and not of wrecks which occurred during the month. Many of the reports received in October relate to casualties which occurred in previous months. The figures include the losses of ten sailing vessels of 565 tons and eight steamers of 4,030 tons belonging to British possessions abroad, involving the loss of the lives of nine persons, of whom eight were lost in sailing vessels and one in a steamer. Casualties not resulting in total loss of vessels, and the lives lost by such casualties, are not included in this report.

PRESENTATION TO SIR JAMES MILLS, K.C.M.G.

Union Steam Ship Company of New Zealand.

ON November 9th, a pleasing ceremony took place at the Institute of Marine Engineers, when Mr. James Adamson, the hon. secretary of the Institute, handed over to Sir James Mills a handsome service of silver plate, the presentation being made on behalf of the engineers of the Union Steam Ship Co., of New Zealand.

Mr. James Adamson said :—Mr. Chairman and Gentlemen—Before proceeding to the reading of the paper on the subject to be brought before us to-night for consideration, I crave your indulgence while I discharge an honourable and a very pleasant duty which has been entrusted to me. I consider it a very high privilege to act, as I have been desired to do, on behalf of the engineers of New Zealand, our comrades in arms, in expressing to you, Sir James, the high estimation in which you are held in their regard. During the many years of service you have given in the Dominion, there have been ample opportunities of forming opinions as to your benign influence in directing the affairs of the Union Co. of New Zealand. It is not a simple and easy matter so to hold the balance amid many interests, and win the approbation of all. When this is done it reflects the highest honour on him who has accomplished it. One of the results of your wise and good administration of affairs has been the desire on the part of the engineers not only to express their high appreciation of you, Sir, but to place on record a tangible token of the high regard in which they hold you, and we have here the token in a form which it is hoped approves itself to you as a work of artistic beauty. The united wish and prayer of the donors is that you may look upon it from time to time with appreciative eyes, and at each look may pleasant memories be aroused, and thoughts of the land beyond the seas where many hearts will respond in warm reciprocation. May it be yours to enjoy for many years to come the pleasure derived from the knowledge that your life work has been well done, and—what is more—appreciated, and that you have thus won the respect and esteem of a community on whose behalf and in whose name I have the honour to make this presentation.

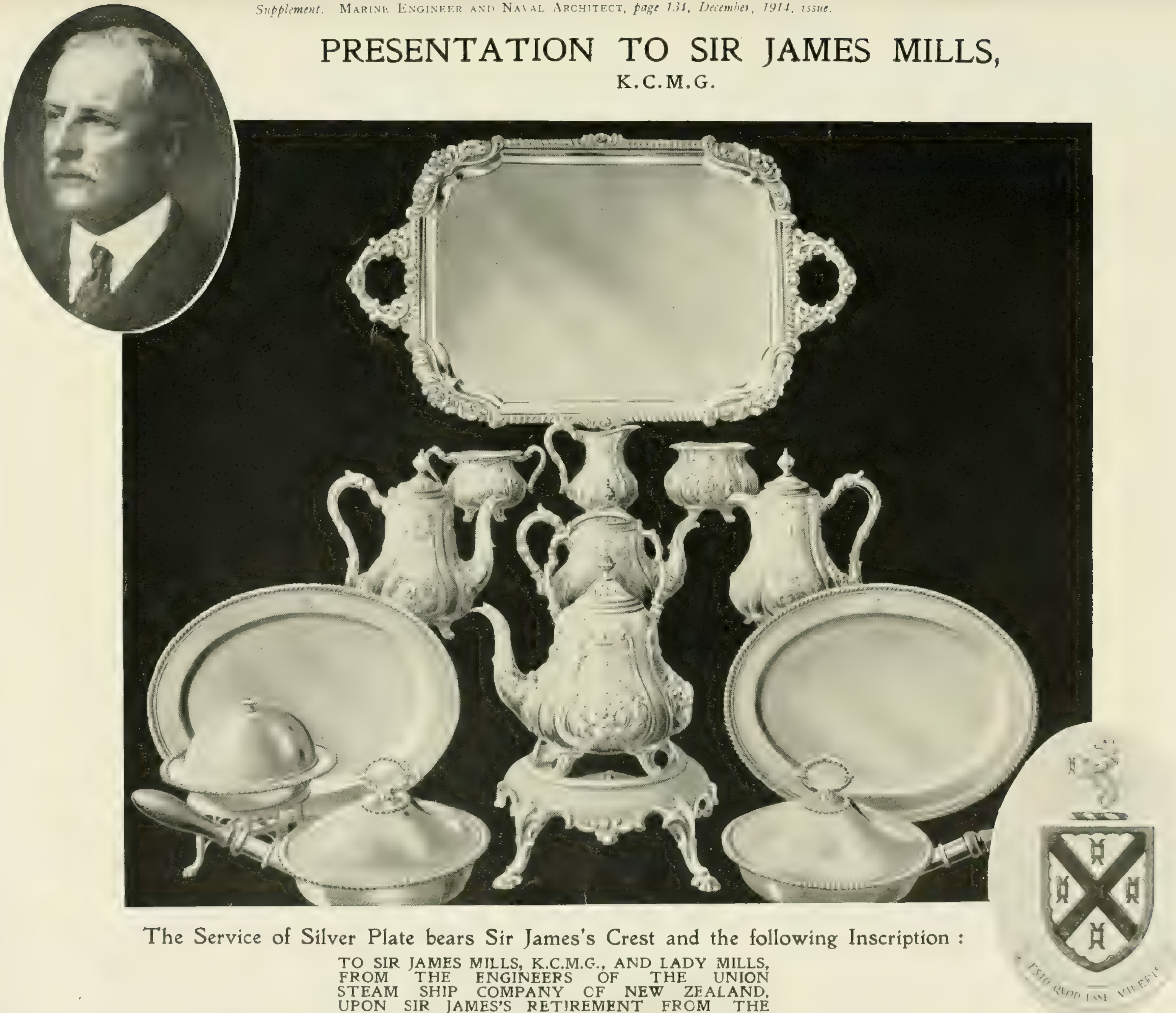
Sir James Mills, in acknowledging the presentation, said :—I feel it a great honour to be here to-night as the guest of the Institute of Marine Engineers, and the more so, to be the recipient of this presentation at the hands of Mr. James Adamson, your honoured—I may say veteran—honorary secretary, who has done so much for the advancement of the organization of marine engineers and for the improvement of their status. I thank you very sincerely for the complimentary remarks which you, Mr. Adamson, have made with regard to myself, and which you have given expression to on behalf of the engineers of the Union Steam Ship Co., New Zealand, and especially have I to express my appreciation of the tangible evidence of their goodwill in the shape of the handsome silver service which they have presented to Lady Mills and myself, and which I notice bears the following inscription :—

> "To Sir James Mills, K.C.M.G., and Lady Mills, from the Engineers of the Union Steam Ship Company of New Zealand, upon Sir James's retirement from the Managing Directorship of the Company."

I can assure you it will be very much valued by Lady Mills and my family, and will be ever present to remind us of the pleasant personal relations which have always existed between the engineers of the Company and myself. I am glad to have this opportunity of reciprocating their good feeling, and of expressing my hearty recognition of the good service and loyalty of the engineers of the Company from its earliest days. It is fitting I should take this opportunity of recognising also the courtesies extended to me by the Wellington District of the Australasian Institute of Marine Engineers as a whole. Ten years ago, in 1904, I was elected an Associate of that body, and was presented with their gold badge, which I now

PRESENTATION TO SIR JAMES MILLS,

K.C.M.G.



The Service of Silver Plate bears Sir James's Crest and the following Inscription :

TO SIR JAMES MILLS, K.C.M.G., AND LADY MILLS, FROM THE ENGINEERS OF THE UNION STEAM SHIP COMPANY OF NEW ZEALAND, UPON SIR JAMES'S RETIREMENT FROM THE MANAGING DIRECTORSHIP OF THE COMPANY.

LIBRARY

wear. I was also then the recipient of a very handsome illuminated address, which now occupies an honoured place in my home. When leaving New Zealand recently, on my retirement from the active management of the Company, I was again presented with a congratulatory address by the Institute. There was a time when our fleet was small, and then I enjoyed the personal acquaintance of our leading engineers. But with the growth of the fleet and its widespread operations over many seas, it has not been possible to know personally more than a few out of something like 350 engineers in our employ, but their loyalty to the Company is evidenced by the work done by the fleet and the condition in which the Company's ships are kept in their department. No one appreciates more than I do the large share the marine engineers have taken in the development of the commerce and sea power of our country. The marine engineer when at work is very much out of the public eye, so that few recognise the great and increasing responsibility attaching to his work of late years, owing to the wonderful development in the marine engine both in size and type, and the multitude of mechanical contrivances which go to make up the equipment of the marine engineer, whether for the purpose of commerce or of war. Nor do they appreciate the great heroism which is called for from him in case of disaster, be it to a merchant ship or a ship of war, when the engineer has to stick to his post until all chance of rescue is lost. I shall be glad if you will convey to the engineers of the Company my thanks for the handsome presentation and their expression of goodwill to me on my retirement from the position of Managing Director of the Company, which I have occupied from its initiation thirty-nine years ago.

Mr. McCaig, in proposing a vote of thanks to Mr. Adamson for making the presentation, said:—Mr. Chairman and Gentlemen—I am one of the oldest members of the Institute of Marine Engineers in New Zealand, and I should like to thank Mr. Adamson for the great trouble he has taken in arranging and carrying through this presentation to such a successful issue. On behalf of the engineers, I thank you, Mr. Adamson, for your great kindness.

Mr. A. E. Battle, in seconding the vote of thanks, said:—In rising to second the vote of thanks to Mr. Adamson, I should like to say that as a Colonial myself I fully appreciate the help which Mr. Adamson has always given to everybody and at every opportunity. Although I left the Dominion some years ago I still feel deeply interested in all its affairs, and I welcome this opportunity of being able to thank Mr. Adamson for the assistance that he has rendered to all Colonials, whenever they have come to this country. Therefore, the engineers of the Colonies have a special debt of gratitude to Mr. Adamson, and to a certain extent they showed their appreciation when on a previous occasion they presented him with the emblem of New Zealand. I was well pleased, as a Colonial, to see the representative rally around the Mother country in the Lord Mayor's procession. This very interesting presentation has taken place on an opportune day and at an opportune time. The Lord Mayor's show was not a show in the usual sense, it was a procession of the Empire. This is only another indication of the great link that binds us all together, not only in time of war, but showing that the link is as strong in times of peace even if not so conspicuous. I have pleasure in thanking Mr. Adamson for the part he has played to-night in connection with this presentation. The vote of thanks was cordially agreed to.

Following the presentation, a paper was read by Mr. John Tait on "The circulation of the Scotch boiler and how it may be improved." The circulator referred to therein was described in our issue of July.

CAPTURE OF ENEMY SHIPS.

In addition to the lists given in our previous issues, the following enemy ships have been captured. The names, which have been given out by the Foreign Office, are listed below, with particulars of tonnage, nationality and place of seizure.

Name & Tonnage.	Nationality.	Where seized.
Achaia, 2,733	Ger.	Alexandria
Aenne Rickmers, 4,083	,,	Alexandria
Annaberg, 4,463	,,	Alexandria
Andros, 2,991	,,	Alexandria
Barenfels, 5,398	,	Alexandria
Brandenberg, 7,532	,,	——
Carl, 1,197	,,	Falmouth
Derflinger, 9,144	,,	Alexandria
Goslar, 4,331	,,	Alexandria
Graecia, 2,753	,,	Gibraltar
Gutenfels 5,528	,,	Alexandria
Haidar Pascha, 3,424	,,	Alexandria
Helgoland, 5,666	,,	Alexandria
Herzogin Elisabeth, 548	,,	Sunk in the Cameroon River.
Koerber, 5,440	Aust.	Alexandria
Lauterfels, 5,811	Ger.	Alexandria
Lutzow, 8,826	,,	Alexandria
Markomannia, 4,505	,,	Sunk at sea
Marquis Bacquehem, 4 396	Aust.	Alexandria
Melpomene, 2,971	,,	——
Paros, 3,576	Ger.	Alexandria
Pindos, 2,933	,,	Alexandria
Pontoporos, 4,049	,,	Captured at sea
Prasident, 3,335	Ger.	Captured in German East Africa.
Rabenfels, 4,678	,,	Alexandria
Rostock, 4,957	,,	Alexandria
Tannengels, 5,341	,	Hong Kong
Ulrich, 2,335	,,	Berehaven
Werdenfels, 4,504	,,	Alexandria

SHIPS WHOSE CARGOES OR PART OF THEM, HAVE BEEN DETAINED.

These names are in continuation of those given in our November issue, page 94.

Name.	Nationality.	Detained at
Aburi	Brit.	Liverpool
Adalia	,,	Zanzibar
Alcantara	,,	Liverpool
American	Dutch	Plymouth
Amsteldijk	,,	London
Amsterdam	Brit.	Harwich
Antilochus	,,	London
Arzila	,,	London
Ashburton	,,	London
Asturias	,,	Southampton
Bassam	,,	Liverpool
Batsford	,,	Grimsby
Berbera	,,	Zanzibar
Brindilla	U.S.	Halifax (N.S.)
Clan Davidson	,,	London
Charlois	Dutch	Portsmouth
Clan Antibes	Brit.	Zanzibar
Clan Macaulay	Brit.	Zanzibar
Clan Macintyre	,,	London
Clan Urquhart	,	London
Clintonia	,,	London
Colchester	,,	Harwich
Colorado	,,	Hull
Copenhagen	,,	Harwich
Corfu	,	London
Cufic	,,	London
Den of Glamis	,,	Durban
Edgerbina	Dutch	Oban
Egret	Brit.	Portsmouth
Egypt	,,	London
Erato	Brit.	Hull
Erich Lindoe	,,	London
Eugene Schnider	French	Cork
Eumaeus	Brit.	London
Francisco	,,	Hull
Galileo	,,	Hull
Golconda	,,	Zanzibar
Harpalyce	,,	Grimsby
Hitano Maru	Jap	London
Intaba	Brit.	London
Ixion	,,	London
Iyo Maru	Jap	London
Kongsfos	Nor.	Zanzibar
Matiana	Brit.	Liverpool
Naiad	,,	Liverpool
New York	U.S.	Falmouth
Norderdyk	Dutch	Falmouth
Ocean	,	Plymouth
Oranje	,,	London
Platuria	U.S.	Stornoway
Polo	Brit.	Hull
Potsdam	Dutch	London
Professor	Brit.	Liverpool
Prosper III.	Nor.	Leith
Ptarmigan	Brit.	London
Regina d'Italia	Ital.	Gibraltar
Rembrandt	Brit.	London
Rhineland	Brit.	Liverpool
Rio Pasig	U.S.	Hong Kong
Rosetta	Brit.	London
Ruperra	,	Bristol
San Giovanni	Ital.	Gibraltar
Saint Marie	French	Glasgow
Scindia	Brit	Liverpool
Strathness	,,	Swansea
Teano	,,	Hull
Tourmaline	,,	Liverpool
Tregarthen		Falmouth
Trent	,,	Liverpool
Tydeus	,,	Liverpool
Virginia	,	Liverpool
Warrior	,,	Zanzibar
Wilis	Dutch	Southampton

Industrial and Trade Notes.

THE CLYDE AND SCOTLAND.

(*From our Own Correspondent.*)

IN these days of arrested operations and "held up" output in shipyards so far as mercantile tonnage is concerned, November 3rd proved quite notable as a day of productiveness on the Clyde. Apart from smaller contributions which may have been made, although not recorded, the waters of the Clyde gave place to three vessels whose united tonnage amounted to 20,550 tons. These were the twin-screw steamer *Kashgar*, 9,000 tons gross, built by Messrs. Caird & Co.; the steamer *Holbein*, 6,300 tons gross, built by Messrs. D. and W. Henderson & Co., Partick, and the steamer *Nizam* of 5,250 tons gross, built by Messrs. Charles Connell & Co., Scotstoun. On November 17th two other steamers of considerable tonnage were sent off the stocks; the *Saint George*, of 5,600 tons gross, built by Messrs. Russell and Co., Port Glasgow, and the *Chakda* of about 4,500 tons, built by Messrs. Alex. Stephen & Sons, Linthouse.

Contracts for no fewer than nine vessels, all of considerable tonnage, have just been placed with firms in Port Glasgow and Greenock.

Messrs. Robert Duncan & Co., whose yard has been without work for some months past, have been successful in securing the order to build two cargo steamers of between 5,000 and 6,000 tons for Messrs. W. S. Miller & Co., of Glasgow.

Messrs. Russell & Co., whose stocks are as usual well occupied, have undertaken to build two vessels of similar tonnage to the above for the same enterprising Glasgow owners.

Messrs. Ferguson Brothers, Port Glasgow, whose shipyard suffered lately from a very severe outbreak of fire, have received orders to build a duplicate dredger of the *Ponrabbel*, which was sunk by the German cruiser *Emden* while outward bound for her destination at Tasmania. This firm are also to build a steamer of smaller dimensions for Sierra Leone.

Messrs. William Hamilton & Co., Port Glasgow, have contracted to build a steamer of 400 ft. length (framed on the Isherwood longitudinal system) for Messrs. J. Chambers and Co., Liverpool. The same builders have secured the order for a second meat-carrying steamer of 450 ft. length for Messrs. Furness, Houlder & Co., London.

Messrs. The Greenock and Grangemouth Dockyard Co., Greenock, have received an order to build a steamer for Messrs. Gow, Harrison & Co., Glasgow, which will be a repeat of the *Vitruvia* recently completed for the same company.

Messrs. A. & J. Inglis, Pointhouse Shipyard, have been commissioned by the Galloway Saloon Steam Packet Co., Leith, to build for their Kirkcaldy, Leven, North Berwick, St. Andrews and deep sea traffic a large and powerful paddle steamer. The vessel, which will have a speed of 18 knots, and superior accommodation for at least 1,000 passengers, will be the finest of the type on the East Coast of Scotland.

Messrs. John Cran & Co., Leith, who recently put through her speed trials the large steam trawler *Craig Island*, built for the Leith Steam Fishing Co., have another similar vessel on the stocks, and are about to lay down two powerful tug steamers for Liverpool owners.

The shipbuilding yard at Kelliebank, Alloa, which at its first off-going was associated with the Grangemouth Company, but which for the past nine months has been shut down, is about to be re-opened by a London Company, who have leased the site for twenty-one years. Several orders for steamers are on hand to be constructed at Alloa.

THE TYNE AND WEAR.

The Tyne.

(*From our Own Correspondent.*)

IN the absence of the right to communicate the amount of work in progress for the Admiralty, it may seem as if the work on the river is only small in quantity. This is very far from being the case. The pressure is very great on the yards where Government work is being carried on, and when it is stated that the Tyne is bearing a big share in redeeming the promise of the First Lord of the Admiralty to replace every lost unit of the Navy by a later vessel, of the most modern and the swiftest character that can be built, it will be seen that the British Navy will still stand before the world supreme, whatever may be the further losses, warfare in its natural hazards may bring about.

That is all that may be said. Still it is curious that when there is such a pressing demand for men in the yards where Government contracts are being pushed on with feverish energy, it still happens that the boilermakers have a large number of unemployed on their books. The boilermakers' and the shipwrights' organizations have contributed some thousands of men to the colours, and Mr. Alex. Wilkie, M.P., says they have been blamed for letting so many men go when their services in the most important work of shipbuilding could not be dispensed with. An effort has been made by a joint conference of representatives of the men and the employers to re-adjust the conditions and make it easier to transfer men from districts in which the work on ordinary shipbuilding is not so pressing, to other yards where men are keenly needed. When the objection of men to removal is overcome by this conference the unemployed list is likely to be greatly diminished.

Business, as I said in my last month's notes, proceeds steadily in the provision of new keels for the mercantile marine, though naturally there is no desire to hasten production in the present state of affairs.

Messrs. Swan, Hunter & Wigham Richardson, of Wallsend, have booked orders for two oil-carrying steamers for the Anglo-Saxon Petroleum Co., London, and it appears that there is not a yard idle on the river, but at the moment there is no keen anxiety to publish the volume of work on which builders are engaged.

Messrs. John Readhead & Sons, of South Shields, are one of the firms which have been engaged in making extensions to cope with the increased tax upon their yard. They are building a new dock 450 ft. long by 65 ft. wide just adjoining the existing dock. The contractors are Messrs. Nuttall and Co., of Manchester, and the dock gates are being made by Messrs. Armstrong, Whitworth & Co., Newcastle.

The Wear.

The output on the Wear so far this year is in advance in point of tonnage on the record of last year; but of course this is unlikely to hold true for the complete twelve months, because of the diminished rate of activity in the building of commercial vessels. The Wear does not share in the activity due to the demands of the Admiralty. New orders on the river include two cargo vessels for Messrs. Short and Co., Newcastle, for Danish owners, and a steam collier for Messrs. Ridley, Tulley & Co., of Newcastle.

TEES AND THE HARTLEPOOLS.

(*From our Own Correspondent.*)

Middlesbrough.

Messrs. **Sir Raylton Dixon & Co.,** Cleveland Dockyard, have a good share of work on hand, and considerable progress is being made with the large twin-screw meat boat for the Houlder, Furness Argentine Steamship Co. They are reported to have secured the contract to build a large cargo boat for the Colonial Sugar Refining Co., Australia, for early delivery; also a small cargo steamer to be engined by Messrs. Richardsons, Westgarth & Co., Ltd.

Stockton and Thornaby.

Messrs. **Blair & Co.,** marine engineers, are reported to have secured the contract to supply the engines and boilers for a large cargo boat to be built on the Tees for Messrs. Crosby, Kerr & Co., Liverpool.

West Hartlepool.

The death of the late Sir Stephen Furness is causing considerable changes in shipping circles. The head office here is to be transferred to Liverpool in January, and all the staff have received notice of such transference.

Messrs. W. Gray & Co. are reported to have secured the contract to build two large cargo steamers for the Ellerman Line, Liverpool, for early delivery.

The local firm of Messrs. Hesler & Co., steamship owners, have had no fewer than four steamers seized by the Germans in the Baltic, *viz.*, s.s. *Anton Fore*, *Crimdon*, *Senegal* and *Belle Isle*.

The Central Marine Engine Works of Messrs. W. Gray and Co., besides the order for the engines and boilers for the Ellerman steamers previously mentioned above, have a large Admiralty order for certain special stampings for the Army which will keep them very busy for some time.

Hartlepool.

Messrs. Irvine's Shipbuilding Co., Ltd., Middleton, are busy, but report no new orders to hand; rapid progress is now being made on the large twin-screw steamer for the Houlder, Furness combine.

Messrs. Richardsons, Westgarth & Co., Ltd., are seriously hampered in their operations owing to shortness of labour. They are reported to have secured the contract to convert a cargo steamer into a water carrier, fitting her out with two additional boilers and a complete installation of evaporators.

THE HUMBER AND DISTRICT.

(*From our Own Correspondent.*)

Trade of the Port of Hull.—The shipping of the port is still keeping normal. Steamers arrive from all parts, but it is a pity to see the continental steamers laid up in the docks owing to the war. A large number of steam trawlers are engaged by the Government mine-sweeping in the North Sea. The fishing trade is fairly well employed and at times some good cargoes of fish come in from the White Sea and Iceland. General labour on the docks is well maintained, and in some cases there is a difficulty in securing men, as so many, having the welfare of the nation at heart, have joined the colours.

Shipbuilders and Engineers are keeping exceedingly busy. The different engine works are working night and day to compete with the great amount of orders they have in hand, also general repair work is very brisk. The shipbuilding yards are kept at full pressure building steamers, trawlers, tugs, etc., and in some yards they are booked up for two years ahead. The repair shops around the fish dock (St. Andrew's) have plenty of work.

Obituary.—We deeply regret to announce the death of Mr. Stephen Embly, who joined the Wilson Line as far back as 1862 as junior engineer. With hard work he soon attained the position of chief engineer and won, by his upright character, the respect of all the sea-going engineers out of Hull. Mr. Embly was chief engineer of the R.M.S. *Orlando*, which, full of passengers, was bound from London to Bombay and Calcutta, when the Suez Canal was opened, and in later years he was in the Mediterranean and Baltic trades. He left the sea in 1884 and came ashore as assistant superintendent engineer. In the year 1908 he secured a pension from the Wilson Line after serving the Company for the long period of forty-six years. He passed away at the ripe age of seventy-five on the 27th October, a great number of engineers and other friends proceeding to the graveside to see the last of one of Hull's old engineers.

MESSRS. R. T. BRUCE & CO.

The well-known compositions, *viz.*, "Nomos" compositions for ships' bottoms and "Farola" anti-corrosive compositions for ships' holds, boot-tops, etc., manufactured by the above firm, at Hull, have a long record of success behind them. They have now been on the market for over twenty-seven years, and the number of testimonials received by the manufacturers affords a guarantee of the quality of the compositions and must be a source of great satisfaction to the members of the firm and staff, who are all British and of British descent. A number of the employés of the firm have joined the colours and their places are being kept open for them. Though a part of the foreign trade of the company has been lost owing to the war, the firm hope, with the support of British owners, to keep the works going at full time. "Nomos" and "Farola" compositions are entirely British, being manufactured in England, and the firm has no branch, affiliated or subsidiary companies, making or partly making their compositions abroad.

DRIVING STEAM HAMMERS.

The query as set out hereunder is placed before the readers of this journal for consideration. An editorial note relating to a case which came under notice some time ago is appended thereto, but correspondence will be welcomed from readers having practical experience in the matter.

Two steam hammers are at present working from a boiler at 120 lbs. per square inch, size of hammers $17\frac{1}{4}$ in. × 3 ft. stroke and $11\frac{1}{16}$ in. × 1 ft. 8 in. stroke. It is proposed to drive these hammers by compressed air at, say, 90 lbs. pressure, from a belt-driven compressor having cross compound air cylinders of the piston inlet type; size of same, $16\frac{1}{4}$ in. diameter × 10 in. stroke and $10\frac{1}{4}$ in. diameter × 10 in. stroke.

It is desired to know the probable results if these hammers were run by air from a large common receiver supplied from the above compressor, and whether this scheme would be efficient or practicable, and if it is likely that the compressor would keep up the supply; what loss should be expected and what alterations, if any, would be required to present hammers to allow of their working economically; also, if above scheme is impracticable, what mode of procedure should be followed to allow of the adoption of compressed air.

Some time ago an engineering workshop was re-arranged. The steam engine and boiler were removed and the machinery was connected up to motors for electric drive. The question of the working of the steam hammers was resolved upon by the introduction of an air compressor, the boiler, formerly the producer for the steam engine, being used as a receiver or accumulator, whence the hammers were supplied with air at about 50 lbs. pressure. The steam in this case was about 80 lbs. The change to pneumatic drive has been quite satisfactory and at the same time an improvement over the steam in several respects.

The air pressure proposed in the enquiry ought to give similar good results: there is no size stated for the accumulator referred to in the enquiry; a good capacity for such would be of considerable advantage to the plant.—Ed. *M. E. & N. A.*

CORRESPONDENCE.

THE STRANDING OF THE S.S. "CALIFORNIA."

To the Editor, Marine Engineer and Naval Architect.

Sir,—In the course of the enquiry into the stranding of the s.s. *California*, frequent reference was made by Mr. D. Wright Smith, instructed by the Mercantile Marine Service Association, to instructions issued by the Admiralty to the officers of H.M. ships as to the use of Thomson or Kelvin sounding machines.

As a result of the reports which have appeared on the above enquiry, the opinion has gained ground in some quarters that the Admiralty warn officers against relying upon the Thomson and Kelvin sounding machines in certain circumstances, and that such warning is superfluous where machines of other makes are employed.

This is an entire misapprehension.

The instructions issued by the Admiralty referred to in the enquiry, are contained in their publication entitled "Notes bearing on the navigation of H.M. ships," 6th edition, 1909, sold by J. D. Potter, 145, Minories, London, E.C., price 2d.

Pages 21 to 24 are devoted to a memorandum originally issued in 1891, and headed "Thomson's or Kelvin's Sounding

Machines." No other style of machine is referred to in the book, presumably for the simple reason that the Sir William Thomson and Lord Kelvin machines are the machines which have been adopted by the Admiralty, and which, for many years have formed, *and still continue to form components of their standard equipment.*

Four pages are devoted to the use and misuse of these machines—to their outstanding advantages when properly handled, and to possibilities of error when misapplied.

On page 24, among other cautions, the memorandum states "His Majesty's ships are not, unless under special orders, justified in running for the land in thick weather, relying on this machine as an unerring guide."

It was this reference, many times reiterated during the Court proceedings, quite apart from its context, which we believe has led to the misapprehension which has gained ground.

We submit, that to take this one sentence apart from its context, from a publication solely devoted to the Sir William Thomson and Lord Kelvin sounding machines (for the reason above mentioned) and on the strength of this clause to state, without further explanation, that the Admiralty have warned officers against relying upon the Thomson or Kelvin sounding machine in certain circumstances, is very likely to lead to a false impression, and to do an injustice to the merits of the machine.

All navigators recognise the inestimable boon conferred upon their art by the introduction by Lord Kelvin of his sounding machine. This was admirably expressed in a letter to the "London Times" of October 14th, 1913, by Admiral Kennedy on the occasion of the unveiling of the memorial to Lord Kelvin in Kelvingrove Park.

The Admiral was paying a tribute to the inventive powers in general of the great scientist, but selected the sounding machine as the subject of his particular appreciation. This is readily understood by all, on reading the Admiral's accounts of narrow escapes from destruction, due solely to the timely use of the sounding machine.

He describes how, on one occasion, a naval vessel reached the harbour of St. John's, Newfoundland, in safety, purely by means of soundings taken by the machine every half hour in fog, gale and blinding snowstorm.

On another occasion, the navigating officer felt assured of safety, where the chart marked 100 fathoms, no bottom. "Throw Thomson overboard," was his superior officer's instructions. "Thomson" was accordingly heaved over, and marked 15 fathoms. "Had we continued on our course, we should have been ashore before daylight."

"The navigating officer was not at fault, but the coast line was not correctly charted."

"No wonder that we sailors bless the name of Lord Kelvin," were the words with which Admiral Kennedy concluded his letter, and this sentiment, we know, is endorsed by thousands of mariners who daily use the Kelvin sounding machine.

KELVIN, BOTTOMLEY & BAIRD, LTD.,
16-20, Cambridge Street, Glasgow, November 2nd, 1914.

REVIEWS.

The Pocket-Book of Refrigeration and Ice-making, edited by A. J. Wallis-Tayler, and published by Messrs. Crosby, Lockwood & Son at 3s. 6d., is now in its sixth edition. The present edition has been carefully revised and a number of pages of new matter have been added, as well as fresh illustrations. There is a great amount of information in the volume, which is arranged in six sections, as follows:—Refrigeration in general, 73 pages; cold storage, 32 pages; ice-making and storing ice, 16 pages; insulation, 23 pages; testing and management of refrigerating machinery, 18 pages; general memoranda, tables, etc., 40 pages. The index has been entirely re-written and extended. The volume should be of great service to all engineers and others interested in refrigeration, cold storage and ice-making, and that it has been so in the past is shown by the fact of six editions having been run since the first publication of the book in 1902.

Brown's Marine Electrician, by Alfred E. Larkman, A.I.E.E., and Alfred H. Larkman, published by Messrs. James Brown & Son, Glasgow, is a useful volume for sea-going engineers. Now in its second edition, the work was first published in 1905 and deals in a concise manner with the information necessary to the marine engineer for the installation, repair and use of electric lighting, heating and other appliances suitable for use in ships. The book is not intended to compete with the many treatises on electricity and magnetism, but rather to give practical information, and the joint authors have achieved this object in an able manner. Taking into consideration the important position now occupied by electricity in the marine world, the acquisition of such a book by the sea-going engineer, dealing as it does in a practical manner with difficulties that may arise, should be of great service to him. There are 244 pages and a large number of illustrations in the volume, which is published at 5s.

Wireless Telegraphy, by W. H. Marchant, published by Messrs. Whittaker & Co., at 5s., is a well-printed and illustrated volume. It is primarily intended for the use of those engaged in the practical operation of radio-telegraph installations, and for those students who already possess some knowledge of electrical science. Considerable space has been given to the description of the Marconi system, particularly as this type of installation is in such general use that hardly any students sitting for the P.M.G. Certificate pass their examinations on any other apparatus. The Poulsen system, representing the arc method of generating electrical oscillations, is also fully described, together with the Goldschmidt alternator. A chapter is devoted to portable installations, and sets suitable for airships, military purposes, yachts and small craft generally, and other chapters contain the principal regulations and instructions for radio-telegraph stations licensed by H.M. Postmaster General, and the various abbreviations, codes, etc., used in working. Mr. Marchant, who has treated his subject ably, is also the author of the "Radio-Telegraphist's Guide."

Notes on Torpedo Work, published by Messrs. Gieve's, Portsmouth, at 1s., is an interesting publication, dealing with torpedo work in H.M. ships. The book has been written to deal with the practical side of torpedo work, and details the torpedo Lieutenant's duties and responsibilities. Practical hints on the care of electrical machinery, etc., are followed by a chapter on the torpedo.

Jane's Silhouettes. At the popular price of 1s., Messrs. Sampson Low, Marston & Co. have recently issued the "Naval Recognition Book" by Fred T. Jane. By making oneself acquainted with the contents of this handy little volume it is possible to identify British warships at sea, as each class of ship is shown in silhouette. In addition, the publication contains a name index of the British Fleet and an extended list of our battleships, showing their class, tonnage, speed, armament, etc. Silhouettes of a number of British liners are also included in the book. We do not know of any other publication published at the price which includes such a complete range of silhouettes.

Preliminary Machine Drawing Course, by C. E. Handy, A.R.C.S., Wh.Sc., and published by Messrs. Longmans, Green & Co. at 1s., is a useful little drawing book, providing a series of suitably graduated examples of machine parts drawn pictorially, to enable the young student to readily get an idea of the form or shape of the piece he is set to draw. The book is intended for use in the class in conjunction with models. Details from certain examination papers have been included.

WEBSTERS LIMITED.

SHIPS' compositions manufactured by Messrs. Websters Ltd., have now been on the market since the year 1854. The invention under which the composition is manufactured is a British invention and the Company, which has its head office in Hull, is British throughout. Messrs. Websters' compositions have stood the test of time and the Company has every confidence in submitting its manufactures to shipowners and others on their own merits. Vessels trading to various parts of the world have been coated with these compositions with satisfactory results, and a large number of ships have been recently coated, including craft for the British Admiralty, and ships owned in Belgium, Russia, Norway, Greece, Italy, etc. Agents and stocks will be found in the various ports and satisfactory results obtained on moderate prices.

LAUNCHES AND TRIAL TRIPS.

THE TYNE AND WEAR.

John Crown & Sons, Ltd., Sunderland.

CHURSTON. Launch, Nov. 3rd. Steel screw steamer built to the order of The Wilton Steam Shipping Co., Ltd., of Dartmouth. The vessel is designed as a modern collier, specially adapted for the Admiralty requirements for the coaling of warships. She has large self-trimming hatches, carries a deadweight of about 3,600 tons on a light draught of water, is fitted with double bottom water ballast, divided fore and aft for trimming purposes, double derricks and winches at each hatch, electric light and all arrangements as a high-class special collier. The engines will be fitted by Messrs. The North-Eastern Marine Engineering Co., Ltd., Sunderland.

Wm. Doxford & Sons, Ltd., Sunderland.

CLAN OGILVY. Launch, Oct. 20th. Large 'tween deck steamer built to the order of The Clan Line Steamers, Ltd. (Messrs. Cayzer, Irvine & Co.), Glasgow. Dimensions: Length, 444 ft.; breadth, 54½ ft.; moulded depth, 32 ft.; deadweight capacity, 8,900 tons. The engines and boilers are being supplied by Messrs. Doxford, and the classification is with the British Corporation.

INDIAN CITY. Launch, Nov. 4th. Steamer built to the order of Messrs. W. R. Smith & Sons, Cardiff. Dimensions:—Length, 392½ ft.; breadth, 52 ft.; moulded depth, 19½ ft.; deadweight capacity, 8,000 tons. The classification is with Lloyd's, 100 A1, and Messrs. Doxford are supplying the engines and boilers.

Sir James Laing & Sons, Ltd., Sunderland.

UMVUMA. Launch, Oct. 19th. Passenger and cargo steamer built for Messrs. Bullard, King & Co., the owners. The vessel is of the two-deck type, with poop, topgallant forecastle and long bridge amidships, forming the principal promenade deck. This is entirely covered by a second promenade and boat deck, with the captain and officers' accommodation at forward end. About sixty first-class passengers will be accommodated in large and well-appointed state-rooms situated on the upper and bridge decks. The arrangements for rapidly shipping and discharging cargo are replete with the latest and most up-to-date details, including nine steam winches, and double derricks to each hatchway, also one derrick for specially heavy lifts; and, of course, the usual auxiliaries, such as windlass, steering gear, dynamo, etc., all having direct steam. The vessel will be lighted throughout by electricity on a generous scale, and large provision is made for refrigerated stores, etc. She has been built to Lloyd's highest class with special survey, and the Board of Trade regulations for passenger steamers. Messrs. George Clark, Ltd., will supply the propelling machinery, which is confidently expected to give the vessel a high rate of speed.

Osbourne, Graham & Co., Hylton, Sunderland.

BELGE. Launch, Nov. 2nd. Steel screw steamer specially constructed to the order of F. C. Svorono, Esq., of Mariupol, Russia. The vessel, whose principal dimensions are 250 ft. long, 36 ft. 6 in. broad, is of the single-deck type, with poop, bridge and forecastle, and carries about 1,600 tons on the exceedingly light draught of 13 in. She is built to Lloyd's highest class on the latest method of construction, with clear holds and deep bulb-angle frames, and has a full and complete outfit of deck machinery. Engine and boilers will be supplied by Messrs. The North-Eastern Marine Engineering Co., Ltd., Sunderland, designed to drive the vessel a speed of 10 knots.

HARLYN. Launch, Nov. 18th. Steel screw steamer, specially constructed to the order of Messrs. Harrisons (London), Ltd., of London. The vessel, whose principal dimensions are 215 ft. long by 32 ft. 6 in. broad, is of the self-trimming collier type and carries about 1,650 tons on a light draught. She has been constructed to Lloyd's highest class and is fully equipped with the most modern appliances for quick handling of cargo. The machinery to drive the vessel will be supplied by G. T. Grey, Esq., of South Shields.

Wm. Pickersgill & Sons, Ltd., Sunderland.

CARTERSWELL. Launch, Oct. 21st. Steel screw steamer built to the order of Messrs. G. N. Patterson & Co., of Newcastle-on-Tyne. Dimensions—: Length, 376 ft.; breadth, 51 ft., and depth, 28 ft. 4½ in. She has been built under special survey to take Lloyd's highest class as a single-deck steamer. The vessel is built on the deep frame system and is fitted with cellular double bottom throughout for water ballast, in addition to which the after and fore peaks are fitted as ballast tanks. She is provided with five large cargo hatches, each of which is fitted with double derricks with tables and outriggers capable of raising heavy weights, large derrick posts being fitted where necessary. The vessel will be rigged as a fore and aft schooner, with steel lower masts and wood telescopic topmasts. Eight steam winches will be supplied and a special quick-warping windlass will be fitted. Steam-steering gear is fitted in house amidships abaft engine-room, and controlled by means of rods and bevelled wheels from wheelhouse on bridge. The machinery and boilers are being supplied and fitted by Messrs. Blair & Co., Ltd., of Stockton-on-Tees, the engines having cylinders 25 in., by 42 in. by 68 in. by 48-in. stroke, and the two large single-ended boilers are of steel with a working pressure of 180 lbs., a large donkey boiler being also supplied by Messrs. Sudron & Co., Ltd., to supply steam to deck machinery.

John Readhead & Sons, Ltd., South Shields.

TREVARRACK. Launch, Oct. 21st. Steel screw steamer built to the order of Messrs. Edward Hain & Son, St. Ives, Cornwall. Dimensions, 382 ft. by 51 ft. 6 in. by 26 ft. 8½ in. The vessel will carry a deadweight cargo of over 7,800 tons on a light draught of water. She is of the complete shelter-deck type to Lloyd's highest class and under their special survey, and has large clear holds fitted with shifting boards, etc., for grain cargoes, with a full equipment of steam winches and derricks for rapid handling of cargo. A large quantity of water ballast is carried in double bottom and peak tank. The vessel will be fitted with triple-expansion engines constructed by the builders, having cylinders 26 in., 42 in. and 69 in. with 48-in. stroke, supplied with steam from two large steel boilers working at a pressure of 180 lbs. per square inch.

Sunderland Shipbuilding Co., Ltd., Sunderland.

SUNLAND. Launch, Oct. 20th. This vessel, which is being constructed under the supervision of Messrs. Flannery, Baggallay & Johnson, is of the following dimensions:—Length, 375 ft.; breadth, 52 ft., and depth moulded, 26 ft. 2 in. She is being built to Lloyd's highest class and has a deadweight capacity of about 9,500 tons and large cubic capacity on Lloyd's summer freeboard, and is built on the deep-frame system, with clear holds to admit of large machinery being carried and deck space kept clear for carrying tram cars, etc. Ten horizontal steam winches with double cylinders 7-in. by 10-in. stroke are fitted. Two 4-ton derricks are fitted to each hatchway and two derricks on port amidships fitted for bunkers, also 30-ton derrick for working No. 2 hatch. The vessel will be propelled by triple-expansion engines by Messrs. George Clark, Ltd., of Sunderland, having cylinders 25 in., 41 in., 69 in. with 48-in. stroke, which will take steam from three boilers of ample power of the cylindrical multitubular type, and will have a working pressure of 180 lbs. per square inch.

Swan, Hunter & Wigham Richardson, Wallsend-on-Tyne.

CUSCATLAN. Launch, Nov. 4th. Steamer built to the order of the Salvador Railway Co., Ltd., Steamship Lines (Messrs. G. T. Symons & Co., managers), for their coasting service in Central America. The steamer, which has a clipper bow, is about 250 ft. in length by 34 ft. broad, and will carry a cargo of 2,000 tons. She has accommodation for over fifty first-class passengers. The dining saloon is a large room on the upper deck amidships, and above it is an elegant smoking room and entrance combined. The vessel is to be propelled by triple-expansion engines, supplied with steam from two boilers.

CLAN ROSS. Trial Trip. This new Tyne-built Clan Line steamer has just been delivered to her owners, after a successful trial run at sea. The *Clan Ross* is a first-class cargo liner, and has been built with a cruiser stern. Her leading dimensions are 445 ft. by 54 ft. by 32 ft. For Launch, see October issue.

Robert Thompson & Sons, Ltd., Sunderland.

BAJA CALIFORNIA. Trial Trip, Oct. 24th. This two-decked freight steamer, built to the order of Mr. A. C. Lindvig, of Christiania, proceeded to sea for her official trial. The trial was very successful, the engines working splendidly, a mean speed of 12 knots being easily attained, and Captain Rustad, on behalf of the owner, also Mr. Olaf Arnesen and Mr. C. F. Christensen, of Det Norske Veritas, expressed entire satisfaction with both vessel and machinery. After the trial the vessel proceeded to Hull to load cargo for San Francisco, under the command of Captain Rustad. For Launch, see November issue. A Cochran (Annan) donkey boiler specially designed for burning oil or coal fuel on the Wallsend-Howden system has been supplied.

Wood, Skinner & Co., Ltd., Newcastle-on-Tyne.
SALERNO. Launch, Oct. 27th. Steel screw steamer built for Mr. Otto Thoresen, of Christiania. The vessel is of the shelter-deck type, having complete wood-sheathed weather deck and has been specially designed for trading between Norwegian and South American ports. A large steel deckhouse is fitted on the bridge deck, on top of which is placed the captain's room, chart-room and wireless telegraphy cabin. The vessel will have all the most modern improvements for the handling of cargo and will also be fitted with electric lighting and wireless telegraph installations. The propelling machinery has been constructed by Messrs. The North-Eastern Marine Engineering Co., Ltd., of Wallsend-on-Tyne, and consists of a set of triple-expansion engines supplied with steam by three large steel multitubular boilers working at a high pressure under Howden's forced draught. Both the ship and engines have been constructed to the requirements and under the special survey of Det Norske Veritas for their highest classification.

Northumberland Shipbuilding Co., Howdon-on-Tyne.
TYSLA. Trial Trip, Nov. 18th. Steel screw steamer built to the order of Messrs. Den Norske Afrika-og-Australie Linie, Tonsberg, left the Tyne for her official trial trip after bunkering at the Commissioners Staithes. The vessel is about 420 ft. long by 53 ft. 8 in. by 36 ft. deep, and has been built under special survey to the highest class at Lloyd's and to the Norwegian Board of Trade regulations. She is fitted with complete shelter deck all fore and aft, the accommodation, which is very ample, being placed in steel houses on the shelter deck. Special attention has been paid to the loading and discharging gear, and a complete outfit for the rapid handling of cargoes arranged for, consisting of eleven steam winches by Messrs. Clarke, Chapman & Co., Ltd., Gateshead-on-Tyne, and a large number of cargo derricks and steam windlass by Messrs. Emerson, Walker & Thompson Bros., Ltd. She is fitted with the usual water ballast arrangements for light passages. The machinery has been supplied by Messrs. Blair & Co., Ltd., Stockton-on-Tees, consisting of engines with cylinders 28 in., 46 in., 75 in. by 51-in. stroke, three large single-ended boilers 15 ft. 9 in. by 11 ft. 6 in., with 180 lbs. pressure. The vessel will carry about 8,250 tons on a light draught and will steam about 12 knots loaded. The trial trip proved in every way satisfactory and a speed of 13 knots was obtained.

Charles Rennoldson & Co., South Shields.
HILDENA. Launch, Nov. 17th. Cargo steamer, built to the order of Messrs. Joseph Monks & Co., Ltd., of Liverpool. The vessel has been constructed to suit the coasting trade, which is a speciality of this firm, and, although not classed at Lloyd's, is far in excess of their requirements. Dimensions, 120 ft. by 23 ft. 6 in. by 11 ft. 1 in. The vessel will be engined by the Shields Engineering and Dry Dock Co., of North Shields, and the boiler has been built by Messrs. Palmers' Shipbuilding and Iron Co. The vessel is completely installed with the very latest improvements for the rapid handling of cargo and the navigation of the ship, and is fitted with a steam windlass and steam capstan, steam cargo winch and horizontal steam-steering gear.

TEES AND THE HARTLEPOOLS.

Wm. Gray & Co., Ltd., West Hartlepool.
CITY OF NEWCASTLE. Launch, Nov. 3rd. Steel screw steamer built for The Hall Line of the Ellerman Lines, Ltd., Liverpool. Dimensions:—Length overall, 473 ft.; breadth, 56 ft. 4½ in., and depth, 33 ft. 9 in. The vessel will be assigned to the highest class in Lloyd's register. She is a handsomely modelled vessel with a cruiser stern, and will be equipped for wireless telegraphy. She has two decks aid, long poop, bridge and topgallant forecastle, and very tasteful cabin accommodation in houses on the bridge deck for passengers, captain, officers and engineers. An electric lighting installation is fitted throughout the vessel. The cellular double bottom extends from stem to stern and a deep tank hold compartment is fitted for water ballast abaft the engine-room, giving a total capacity for water ballast of about 2,400 tons. The whole of the equipment is of the most approved description including sanitary tanks, fresh water distiller, steam windlass, steam steering gear, fifteen steel derricks, thirteen steam winches with return exhaust to winch condenser of the "CMEW" type. Triple engines are being supplied by The Central Marine Engine Works of the builders, having cylinders 26 in., 44½ in. and 77 in. diameter with a stroke of 51 in., and three large steel boilers of the flanged shell type, adapted to work at a pressure of 220 lbs. per square inch, and fitted with Howden's system of forced draught. A special feature of the boiler installation is the "CMEW" type superheater, designed and made by the engine builders with a view of utilizing to the utmost the heat from the gases on their way to the chimney. There is also an arrangement of heating the boiler feed water by means of the exhaust steam from the auxiliaries so that heat that would otherwise be wasted is utilized to the best advantage in reducing the consumption of coal. The engine-room auxiliaries are very complete, and include an auxiliary condenser, evaporator, feed and ballast pumps, gravitation feed-water filter, feed-water purifier and grease separator, all of the "CMEW" type. Amongst the many up-to-date appliances with which the vessel will be fitted is the "CMEW" thermo-couple installation, designed and made by the engine builders. The instrument is devised for registering the temperature by electrical means, of the gases in the combustion chamber of the boilers, the temperature on passing through a boiler tube, the smokebox, and on through the superheater and airheater to the chimney. The temperature of the superheated steam as it enters the stop valve in the engine-room is also registered. By means of this interesting appliance the temperature may be read off the scale which is placed in a convenient position in front of the engines, and much valuable data will be obtained which will enable the owners to judge the varying merits of the different classes of coal used.

NIRVANA. Trial Trip, Oct. 27th. The trial trip took place on the above date of this steel screw steamer, built for the British India Steam Navigation Co., Ltd., London. Dimensions:—Length over all, 463 ft. 6 in.; breadth, 56 ft., and depth, 29 ft. 8 in. A very satisfactory trial was effected, the vessel afterwards proceeding to Middlesbrough to load. For Launch, see October issue.

ROSALIE. Launch, Oct. 21st. Steel screw steamer built for Messrs. John Cory & Sons, Ltd., Cardiff. She will take the highest class in Lloyd's register and is of the following dimensions, *viz.*:—Length over all, 388 ft.; breadth, 52 ft., and depth, 27 ft. 2 in., with extra long bridge, poop and topgallant forecastle. The hull is built with deep frames, cellular double bottom and large after and fore peak ballast tanks, ten steam winches, ten derricks, steam steering gear amidships, hand screw gear aft, patent direct steam windlass, steel grain divisions, stockless anchors, telescopic masts with fore and aft rig, boats on deck overhead, and all requirements for a first-class cargo steamer. Triple-expansion engines are being supplied by the Central Marine Engine Works of the builders, having cylinders 25 in., 41 in. and 68 in. diameter with a stroke of 48 in., and three large steel boilers adapted for 180 lbs. working pressure per square inch. The engine-room auxiliaries include a winch condenser, evaporator, feed and ballast pumps of the "CMEW" type.

NOLISEMENT. Launch, Nov. 16th. Steel screw steamer for Messrs. Ralph E. Morel & Co., Cardiff, built to take the highest class in Lloyd's register, and of the following dimensions, *viz.*:—Length over all, 392 ft.; breadth, 52 ft., and depth, 28 ft. 6 in., with extra long bridge, poop and topgallant forecastle. The hull is built with deep frames giving large clear holds, cellular double bottom and large aft-peak ballast tank, ten steam winches, steam-steering gear amidships, hand-screw gear aft, patent direct steam windlass, shifting boards throughout, stockless anchors, telescopic masts with fore and aft rig, boats on deck overhead, and all requirements for a first-class cargo steamer. Triple-expansion engines are being supplied by the Central

Marine Engine Works of the builders, having cylinders 25 in., 41 in. and 68 in. diameter, with a piston stroke of 48 in., and three large steel boilers for a working pressure of 180 lbs. per square inch. The engine-room auxiliaries include a winch condenser, evaporator, feed and ballast pumps, of the 'CMEW" type.

Irvine's Shipbuilding & Dry Docks Co., Ltd., West Hartlepool.

CLUTHA RIVER. Launch, Oct. 20th. Steel screw steamer built to the order of Messrs. Furness, Withy & Co., Ltd., for the British Empire Steam Navigation Co., Ltd., London. The dimensions are 412 ft. by 52 ft. by 30 ft. depth moulded, carrying over 8,200 tons on a moderate draught. She is built to Lloyd's highest class, having complete main and upper decks of steel with poop, bridge and forecastle, and water ballast is carried in cellular double bottom and fore and after peaks. The vessel is constructed on the deep frame principle, giving exceptionally clear holds for the stowage of bulky cargoes, and is divided into seven water-tight compartments by six transverse bulkheads. Wood grain divisions are fitted throughout the holds, four large hatches are provided, together with a cross-bunker hatch, and the vessel is replete with all the latest facilities for the rapid loading and discharging of cargo, including ten steam winches and ten derricks. A powerful quick-warping steam windlass is fitted forward, and combined steam and hand-steering gear on the Wilson & Pirrie principle is fitted in a house aft with telemotor connection to the bridge. A large ice house is also fitted for the crew's provisions, etc, The 'tween decks are exceptionally lofty, and are fitted with side lights all fore and aft. A complete installation of cattle water service pipes with tank is fitted, together with a 4,000 gallon fresh water condenser. The lighting, heating and sanitary arrangements have received special attention, the most improved methods being adopted throughout. The machinery, which has been constructed by Messrs. Richardsons, Westgarth & Co., Ltd., Hartlepool, consists of a set of "Richardsons" standard triple-expansion engines, having cylinders 26 in., 42 in. and 70 in. by 48 in. with three large boilers, 180 lbs. pressure. The condenser is of the contraflo type, and the engine-room auxiliaries include a contraflo winch condenser, cascade filter, Morison's evaporator, etc.

BRISBANE RIVER. Trial Trip, Nov. 7th. Steel screw steamer. The official trial trip of this steamer was run on the above date in Hartlepool Bay. For Launch, see September issue.

SAGAMA RIVER. Launch, Nov. 18th. Steel screw steamer built to the order of Messrs. Furness, Withy and Co., Ltd., for the British Empire Steam Navigation Co., Ltd., London. Dimensions, 400 ft. by 52 ft. by 29 ft. 6 in. depth moulded, carrying over 8,000 tons on a moderate draught. She is built to British Corporation classification, having a single deck of steel, with poop, bridge and forecastle, and water ballast is carried in cellular double bottom and fore and after peaks. The vessel is constructed with deep frames and longitudinal stringers, giving clear holds for the stowage of bulky cargoes, and is divided into seven watertight compartments by six transverse bulkheads. Wood grain divisions are fitted throughout the holds according to the Board of Trade regulations, four large hatches are provided, together with a cross bunker hatch, and the vessel is replete with all the latest facilities for the rapid loading and discharging of cargo, including ten steam winches, and ten derricks. A powerful quick-warping steam windlass is fitted forward, and combined steam and hand-steering gear is fitted in a house aft, with telemotor attachment to the bridge. A large ice house is also fitted for the crew's provisions, etc. The lighting, heating and sanitary arrangements have received special attention, the most improved methods being adopted throughout. The machinery, which has been constructed by Messrs. Richardsons, Westgarth & Co., Ltd., Hartlepool, consists of a set of "Richardsons" standard triple-expansion engines, having cylinders 25 in., 40 in. and 68 in. by 48 in., with three large boilers working at 180 lbs. pressure. The condenser is of the Contraflo type, and the engine-room auxiliaries include a Contraflo winch condenser, cascade filter, Morison's evaporator, etc.

Richardson, Duck & Co., Ltd., Stockton-on-Tees.

AMPLEFORTH. Launch, Oct. 31st. Steel screw steamer. Dimensions:—Length over all, 373 ft.; breadth extreme, 50 ft.; depth moulded, 26 ft. 8 in.; deadweight, about 6,500 tons. This vessel, which has been built to the order of Charles Cravos, Esq., of Cardiff, will class 100 A1 in Lloyd's register, and has been built under special survey. She is of the single-deck type with clear holds, beams and quarter pillars being dispensed with—has a poop in which crew will be berthed—bridge amidships with steel houses on same for accommodation of captain, officers, engineers, apprentices, etc., and topgallant forecastle with paint and lamp-rooms under same. A cellular double bottom throughout and forward and after peak tanks are fitted for carrying water ballast. There are two large cargo hatches in each well, and equipment includes a large donkey boiler, 180 lbs. pressure—eight steam winches exhausting to a winch condenser which is fitted with circulating pump—steam steering gear with Taylor's economic valve steam windlass with quick-warping ends, fresh water condenser, rudder brake, extra large fresh water tanks, fire extinguishing pipes to holds, etc. Derrick tables and crosstrees are fitted to masts, and double derricks are fitted to each hatch. The propelling machinery by Messrs. Blair & Co., Ltd., has cylinders 25 in., 41 in. and 67 in. by 45-in. stroke, steam being supplied by two large single-ended boilers having a working pressure of 180 lbs. An evaporator and feed filter and a Crompton ash hoist will be fitted, and spare gear includes spare tail and shaft which will be placed in a recess in tunnel.

Ropner & Sons, Ltd., Stockton-on-Tees.

STEAMER. Launch, Oct. 20th. Steel screw steamer. Dimensions:—Length, 398 ft. 3 in.; breadth extreme, 53 ft. 6 in.; depth moulded, 36 ft. to shelter deck. The vessel is built to the highest class at Lloyd's, having upper and shelter decks. The saloon and cabin for the captain, officers and engineers will be fitted up in iron houses on the shelter deck, the crew being berthed forward. She will be fitted with water ballast tanks on the cellular principle fore and aft, the after peak also being fitted as a water ballast tank. The vessel has a direct steam quick-warping windlass, stockless anchors, steam steering gear amidships, with powerful screw gear aft, and is fitted with ten large steam winches, all working at 100 lbs. steam pressure. Double derricks are fitted to each hatch, and all the vessel's appliances for loading and discharging cargoes expeditiously are very complete. Triple-expansion engines will be supplied by Messrs. Blair and Co., Ltd., of Stockton-on-Tees, having cylinders 25 in., 42 in., 68 in. by 48-in. stroke, steam being supplied by three single-ended boilers, each 14 ft. 3 in. by 11 ft., with a working pressure of 180 lbs., and fitted with evaporator, etc.

THE HUMBER.

Cochrane & Sons, Ltd., Selby.

ACANTH AND BONA DEA. Launches, Oct. 21st. Two steel screw trawlers. Dimensions, 140 ft. by 24 ft. by 13 ft. 3 in. moulded. The vessels have been built to the order of Messrs. The Equitable Steam Fishing Co., Ltd., Grimsby, and will be fitted with powerful triple-expansion engines by Messrs. Earle's Shipbuilding and Engineering Co., Ltd., Hull.

TRAWLER. Launch, Oct. 22nd. Steel screw trawler. Dimensions, 130 ft. by 24 ft. by 13 ft. 9 in. moulded. The vessel has been built to the order of Messrs. The Crown Steam Fishing Co., Ltd., Fleetwood, and will be fitted with powerful triple-expansion engines by Messrs. Amos & Smith, Ltd., Hull.

JAMAICA. Launch, Nov. 4th. Steel screw fleeter. Dimensions, 112 ft. by 22 ft. 6 in. by 13 ft. 2 in. moulded. The vessel has been built to the order of Messrs. The Hull Steam Fishing and Ice Co., Ltd., Hull, and will be fitted with powerful triple-expansion engines by Messrs. C. D. Holmes and Co., Ltd., Hull.

TORONTO. Launch, Nov. 19th. Steel screw fleeter. Dimensions, 112 ft. by 22 ft. 6 in. by 13 ft. 2 in. moulded. The vessel has been built to the order of Messrs. The Hull Steam Fishing and Ice Co., Ltd., Hull, and will be fitted with powerful triple-expansion engines by Messrs. C. D. Holmes & Co., Ltd., Hull.

ST. DENIS. Launch, Nov. 19th. Screw trawler. Dimensions, 133 ft. 4 in. by 23 ft. by 13 ft. 1 in. moulded. The vessel has been built to the order of Messrs. T. Hamling and Co., Ltd., Hull, and will be also fitted with engines by Messrs. Holmes.

Livingstone & Cooper, Ltd., Hessle.

MARNE. Launch, Nov. 19th. A splendidly modelled steam trawler, length between B.P. 125 ft., breadth moulded 22 ft. 4 in., depth moulded 13 ft. 1 in. The vessel is built of steel, exceeding Lloyd's requirements, to the order of Messrs. The East Riding Steam Fishing Co., Ltd. She has a raised quarter deck, whaleback forecastle, large elaborate cabin aft, handsome chart-room below, wheelhouse, large bunkers and spare fish room. The vessel is being fitted out complete with the latest type of fishing gear and deck fittings.

SCOTLAND.

Ailsa Shipbuilding Co., Ltd., Troon.

RAVEN. Trial Trip, Oct. 15th. This new screw steamer built for the General Steam Navigation Co., London, has run official trials on the Clyde. A speed of half a knot over contract requirements was attained on the measured mile, and the trials proved satisfactory in all respects. After the trial the *Raven* left Troon for London. For Launch, see August issue.

Ailsa Shipbuilding Co., Ltd., Ayr.

SEAMEW. Launch, Oct. 21st. Screw steamer built for the General Steam Navigation Co., London. The vessel, which is of the shelter-deck type, is of the following dimensions :—Length, 250 ft. between perpendiculars ; breadth, 37 ft., and depth, 25 ft. Machinery designed to give a speed of 12 knots will be supplied by the builders. The *Seamew* is a sister ship to the *Raven*, see August issue.

Ardrossan Dry Dock & Shipbuilding Co., Ltd., Ardrossan.

KINABULU. Launch, Oct. 27th. Three-masted cargo and passenger steamer, built for the Sabah Steamship Co., Ltd., Sandakin, British North Borneo. The registered dimensions of the vessel are 150 ft. 4 in. by 26 ft. by 10 ft. 6 in. She has a continuous main deck, with poop and part awning deck, also topgallant forecastle and bridge houses. The machinery will consist of a set of triple-expansion engines, having cylinders 15 in., 21 in. and 34 in. in diameter respectively, with a stroke of 24 in., and a working pressure of 180 lbs. A full outfit of derricks and winches is provided for the expeditious handling of cargo ; also steam windlass and steam-steering engine.

Barclay, Curle & Co., Whiteinch.

MERKANA. Trial Trip, Oct. 27th. The *Merkana*, built for the British-India Steam Navigation Co., has completed her trials successfully. This is the fourth vessel constructed by the builders for the same owners. For Launch, see October issue.

Bow, McLachlan & Co., Paisley.

H.M.S. CAMEL. Launch, Oct. 18th. Powerful steel paddle tug, built throughout to latest Admiralty requirements under the superintendence of Commander Shattock, R.N., and Mr. W. H. Owen. Machinery will be supplied by the builders.

Caird & Co., Greenock.

KASHGAR. Launch. Twin-screw steamer built for the Peninsular and Oriental Steam Navigation Co. Dimensions : Length, 496 ft. ; breadth, 58 ft. 3 in. ; depth, 37 ft. 8 in. ; and measurement about 9,000 tons gross. The *Kashgar* is an intermediate passenger and cargo steamer, and is intended for the Eastern service. She will have accommodation for seventy-five first-class and seventy second-class passengers. Messrs. Matthew Keenan & Co. are covering the boilers and steam pipes throughout the vessel with their Patent Non-Conducting Composition and are also supplying their patent Bulkhead Insulation for the engine and boiler casings.

Charles Connell & Co., Scotstoun.

NIZAM. Launch. Steamer of about 5,250 tons gross, built to the order of Messrs. Turner & Co., Liverpool. The vessel has first-class state-rooms on the bridge deck, and cargo and deck machinery of the most approved description. Messrs. Matthew Keenan & Co. have the contract to cover the boilers and all steam pipes with their Patent Compositions. The engines are to be supplied by Messrs. Dunsmuir and Jackson, Ltd., Glasgow.

Fleming & Ferguson, Paisley.

STEAMER. Launch, Oct. 21st. Hopper steamer of 800 tons built to the order of the Dundee Harbour Trust. The vessel, which has been built to scantlings in excess of Lloyd's requirements for the 100 A1 class, was designed by and constructed under the superintendence of Mr. J. Hannay Thompson, C.E., of the Dundee Harbour Trust, Mr. William Adam, Paisley, being resident inspector.

John Fullerton & Co., Paisley.

BRIGADE. Launch, Oct. 21st. Screw steamer of 500 tons deadweight, built to the order of the Mason Shipping Co., Liverpool. The vessel is a sister ship to the *William Mason*, which the firm completed lately for the same owners. Compound engines of 400 i.h.p. will be supplied by Messrs. Fishers, Ltd., Paisley.

A. Hall & Co., Aberdeen.

BEN ALDER. Launch, Oct. 17th. Steam trawler, built for Messrs. Richard Irvin & Sons, Aberdeen. Dimensions : Length, 115 ft. ; breadth, 22 ft. ; and depth, 12 ft. 9 in.

Hawthorns & Co., Leith.

COMMANDANT. Launch, Oct. 18th. Steam trawler—the first of three the firm are building for Mr. Thomas L. Devlin, Granton. The vessel will be fitted with machinery by the builders. It may be noted in connection with this launch that Mr. Devlin is the individual owner of the largest fleet of vessels engaged in the trawling industry.

Wm. Henderson & Co., Ltd., Glasgow.

LOMPOC. Trial Trip, Oct. 30th. This steel screw tank steamer, built to the order of the Bear Creek Oil and Shipping Co., Ltd. (Messrs. C. T. Bowring & Co., Ltd., managers), underwent her trials on the Firth of Clyde. Dimensions of vessel :—448 ft. by 56 ft. by 33 ft. 8 in., with a deadweight carrying capacity of about 10,500 tons. The *Lompoc* is, with one exception, the largest oil tank steamer yet built on the Clyde, and has been constructed under the supervision of Messrs. Jacobs & Barringer, Ltd., London, whose local surveyors have been Messrs. Bradney & Patton. During the trials everything went satisfactorily and a mean speed of about 12 knots was easily maintained. For Launch, see November issue.

D. & W. Henderson & Co., Ltd., Glasgow.

HOLBEIN. Launch, Nov. 3rd. Large steel screw steamer, about 6,300 tons gross, built to the order of Messrs. Lamport & Holt, Ltd., Liverpool. This addition to the owners' already large fleet of vessels is 450 ft. long over all by 55 ft. broad by 30 ft. depth moulded, is classed in Lloyd's 100 A1, and fulfils the requirements of the Board of Trade for their passenger certificate. She is rigged as a two-masted schooner, and has an exceptionally large number of powerful derricks and steam winches, which provide ample means for the rapid handling of large cargoes. Accommodation is provided for a limited number of first-class and about 200 third-class passengers. The vessel is replete with everything that can add to safety and the comfort of those on board, including electric light installation, extensive refrigerating plant, powerful combined steering gear with telemotor control and steam heating throughout all accommodation. The machinery, which has been constructed by the builders, consists of quadruple-expansion engines, balanced on the Yarrow, Schlick & Tweedy system, having cylinders 25½ in., 36 in., 51 in. and 73½ in. diameter by 54-in. stroke, with steam from three double-ended boilers at 215 lbs. pressure.

Russell & Co., Port Glasgow.

VANDUARA. Launch. Steamer built for Messrs. Gow, Harrison & Co., Glasgow. Dimensions :—Length, 338 ft. ; breadth, 54 ft. ; and depth, 36 ft. 3 in. She has been built to Lloyd's highest class, and is of the shelter-deck type.

SAINT GEORGE. Launch, Nov. 17th. Steamer built for Messrs. Rankin, Gilmour & Co., Liverpool. Dimensions : Length, 424 ft. ; depth, 53 ft. ; breadth, 32 ft. 6 in. She is built to Lloyd's highest class, and is of 5,600 tons gross. The vessel proceeded to Glasgow, where she will be engined by Messrs. David Rowan & Co.

A. Stephen & Sons, Glasgow.

UMETA. Trial Trip. This new steamer, for the British India Steam Navigation Co., has completed very satisfactory trials in the Firth. The vessel, which is a sister to the *Umaria*, recently delivered to the owners by the same builders, is 410 ft. in length, 52 ft. in breadth, and 31 ft. in depth. She is intended for the Eastern coastal trade. The fitting out of the *Umeta* was, it may be added, a remarkably rapid performance. The launch took place on the 1st

October, and the vessel left the harbour on the 16th. Omitting two Sundays, and allowing for other unavoidable delays, the vessel was practically completed in twelve working days from the date of launching. Considering the size, type and horse-power of the ship, this is a very smart performance—if it does not actually constitute a record. For Launch, see November issue.

Wm. Beardmore & Co., Dalmuir.

NEARCHUS. Launch, Nov. 18th. Lighthouse tender for the India Office, constructed to the design of Sir John H. Biles and under his supervision. The vessel, which is 183 ft. in length, 29 ft. 3 in. in breadth, and 14 ft. 6 in. in depth, is of about 900 tons gross. The machinery consists of geared turbines developing 600 i.h.p., giving a speed of 11 knots. Steam will be supplied by a Yarrow boiler designed to use oil fuel. The vessel is intended for service in the Persian Gulf, and was launched with machinery on board. A Cochran (Annan) donkey boiler especially designed for oil burning, Kermode system, has been supplied.

Lobnitz & Co., Ltd., Renfrew.

POUYER QUERTIER. Launch, Nov. 18th. Pilot boat built to the order of the Pilotes de la Seine for service at Havre. The vessel is fitted with triple-expansion engines and classes at Lloyd's. Her dimensions are 98 ft. 6 in. by 21 ft. 4 in. by 11 ft. 6 in., and she is fitted with electric light and all special requirements for the service.

A. Stephen & Sons, Ltd., Linthouse.

CHAKLA. Launch, Nov. 17th. Screw steamer for the Indian Coasting Service of the British India Steam Navigation Co., Ltd. Dimensions:—Length, 330 ft. b.p.; breadth, 46 ft.; depth, 32 ft. She will carry a number of first and second-class passengers in well-furnished cabins with dining saloons, etc., suited to the Indian climate. Her cargo fittings, winches and steel derricks hung on Samson posts are very complete, and suited for rapid handling of cargo. The propelling machinery, consisting of one set of triple-expansion engines with four large single-ended boilers, will be supplied by the builders. Messrs. Wailes, Dove & Co.'s "Bitumastic" (brand) enamels and coverings have been applied to the bunkers, boiler-room tank and tank top in boiler-room, etc.

IRELAND.

The Dublin Dockyard Co., Ltd., Dublin.

SHOREHAM. Launch, Oct. 28th. Steel screw steamer built to the order of Messrs. John Harrison, Ltd., London, for their general cargo trade between French ports and London. She is an up-to-date vessel having a deadweight carrying capacity of 1,000 tons. The dimensions are:—Length, between perpendiculars, 200 ft.; breadth moulded, 30 ft. 6 in.; depth moulded, 14 ft. The vessel is of the raised quarter-deck type, with machinery placed aft, and has specially large hatches for self-trimming purposes and to facilitate the handling of cargo. She has a complete installation of modern deck machinery for efficient navigation and handling of vessel and cargo in port. The cargo winches and derricks are suited for heavy loads. The propelling machinery consists of a set of triple-expansion engines of high power, working at a pressure of 180 lbs. per square inch, with large main and donkey boilers. The hull and machinery had been built under Lloyd's special survey in excess of their 100 A1 class.

Workman, Clark & Co., Belfast.

CARMARTHENSHIRE. Launch, Nov. 5th. Steamer built to the order of the Royal Mail Steam Packet Co., London. The *Carmarthenshire*, 485 ft. in length, with a gross tonnage of about 9,000, has been built under special survey for the highest class in Lloyd's registry of shipping and complies with the requirements of the British Board of Trade for a passenger steamer. Accommodation is provided for a few first-class passengers, in comfortable state-rooms in a large deckhouse amidships, while the poop and bridge spaces are arranged so as to be readily converted for the reception of about 550 steerage passengers, with suitable dining spaces, etc. The cargo space is divided into six holds, one of which has been arranged so that it can be used as a deep-water ballast tank. Owing to the adoption of the girder system of construction the cargo spaces are free of obstruction and are thus capable of receiving the largest type of consignments. A number of cargo compartments at the after end have been insulated and prepared for carrying general refrigerated cargo, such as frozen meat, dairy produce and fruit, and a portion of these spaces has been fitted up for the storage of the ship's provisions. For the preservation of this perishable cargo, suitable refrigerating machinery has been installed. An installation of wireless telegraphy has been provided. The propelling machinery consists of a set of quadruple-expansion engines, with the necessary auxiliary appliances, and supplied with steam from four single-ended boilers working under forced draught.

ESSEQUIBO. Trial Trip, Nov. 4th. This new steamer left Belfast Lough on the above date and proceeded down the Lough for adjustment of compasses and to undergo machinery tests and speed trials. The results were all highly successful, and the vessel afterwards left for London, from which port she sails on the initial voyage to the West Indies, being intended for the West Indies, Colombia, Panama Canal and New York mail and passenger service. The vessel has been built under Lloyd's special survey for the highest class in their Registry, and complies with the requirements of the British Board of Trade and the United States Steamship Inspection Service for a first-class passenger steamer. For Launch, see August issue.

PYRRHUS. Trial Trip, Nov. 17th. This new Holt Line steamer left Belfast Harbour and proceeded down the Belfast Lough to Carrick Roads on the above date for machinery tests and speed trials. The results were highly satisfactory and the vessel afterwards left for Newport prior to proceeding to Birkenhead to complete cargo for the maiden voyage. For Launch, see October issue.

Harland & Wolff, Belfast.

ALMANZORA. Launch, Nov. 19th. Steel triple screw passenger steamer built for the Royal Mail Co.'s South American mail service. The *Almanzora* is nearly 600 ft. long by 67 ft. beam, and will be about 15,600 tons gross. She is a triple-screw vessel, and will have a combination of reciprocating and turbine engines. To meet the requirements of the frozen and chilled meat trade, the *Almanzora* will be provided with an extensive installation of refrigerating plant and insulated chambers. The luxurious character of the passenger accommodation in the Royal Mail steamers is well known, and in the *Almanzora* special care is being taken to ensure that the decorations will satisfy the most æsthetic taste, the style of the different rooms being varied, with a view to ensuring the most artistic effect. The first-class dining saloon will accommodate about 400 people. The vessel will be fitted with a passenger lift serving five decks, gymnasium, barber's shop, dark-room for photography, cloak-room, enquiry office and servants' rooms. The promenade decks will be spacious. Special attention is also being paid to the second and third-class accommodation, which will be a distinct feature of the vessel.

BOILER EXPLOSION ENQUIRY.

An explosion occurred a few months ago at a generating station, in a water-tube boiler, which resulted in scalding injuries to an engineer and attendant. One of the tubes split and opened out for fully 9 in., and through the opening the contents of the boiler burst into the boiler house, the steam pressure at the time being about 100 lbs. The tube, on examination, was found to have been reduced by external corrosion. Some nine months previous to the giving way of the tube the boiler had been tested to 260 lbs. water pressure; six months thereafter it was overhauled and on the completion of the overhaul it was tested to 160 lbs. water pressure with the object of seeing that the joints were tight. A steam jet was used in the furnace and it appeared as if the vapour from this had acted detrimentally on the tube and accelerated corrosion. See Board of Trade Report No. 2319.

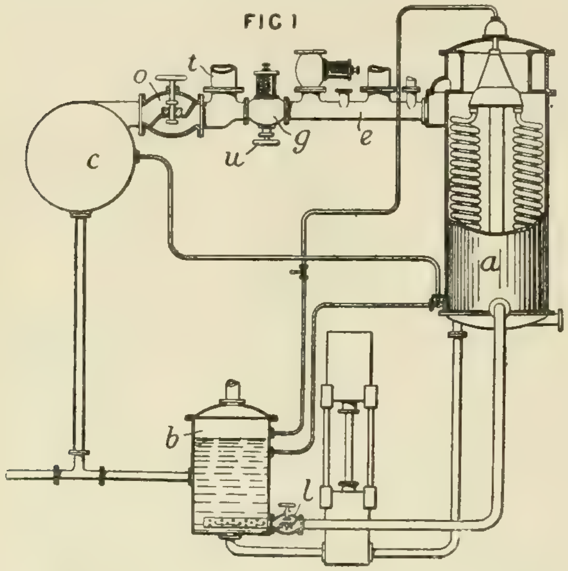
"SIDEROSTHEN" SOLUTION.—Messrs. D. Anderson and Son, Ltd., of West Hartlepool, have coated the holds and 'tween decks of the British steamer *Glengyle* with their Siderosthen anti-corrosive solution. This steamer was launched on July 9th by Messrs. R. & W. Hawthorn, Leslie and Co., Ltd., for the Glen Line. The vessel is 516 ft. length 62 ft. breadth and 37 ft. 6 in. depth, and her tonnage is 13.400 tons.

Abridgments of New Patents.

Compiled by Messrs. E. P. Alexander & Son, Chartered Patent Agents, 306, High Holborn, London, W.C.

15,413. Heating Feed-water. In a feed-water heating system for use on board ship and under normal conditions, as on a voyage, a pipe *e* receives all the available exhausts such as those from the feed, air, or other pumps, the evaporator, the electric-light engine and the water drainages. By means of a control valve *g*, these pass preferably into a primary heater *a* and it may be into the secondary heater *b* through the loaded valve *l* until the pressure exceeds the predetermined limit, whereupon the control-valve *g* lifts and steam passes through the deflecting-valve *o* into the condenser *c*. When the deck machinery is used in port, the exhaust entering by the pipe *t* is caused to pass preferentially to the primary heater by the valve *o* being loaded and the valve *g* being held open by the handle *u*. In a modification, the steam not used for heating is by-passed from the primary heater for use in a turbine, and when not so used is discharged to the condenser as before.

FIG I



15,680. Turbine Blades. Blades for axial-flow turbines are made of diminishing thickness from their outer to their inner ends. In Fig. 14, the upper part shows a cross-section of the blades *a* at their inner ends, whilst the lower part shows a similar cross-section at their outer ends. The increase of thickness is preferably attained by varying the convex surface of each blade, the concave surface being uniform and radial from root to tip. The entrance and exit angles and the cross-section of the steam passage-ways vary from root to tip. The dimensions are chosen so that the hump or convex portion of a blade overlaps the tip of the adjacent blade over the whole radial length of the blade. Shrouding-rings at the roots and tips of the blades are cast on. For this purpose the blades are set in a core *h*, Fig. 11, with their ends projecting, and the core is placed in a mould *i* as shown. For making the core, a core-box as shown in Fig. 1 is used, comprising inner and outer segments g^1, g^2. The segments are provided with notches g^0 for holding the blades in position whilst the core is being made.

FIG.14.

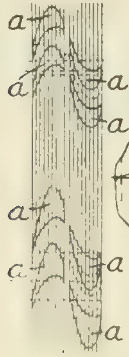


FIG I

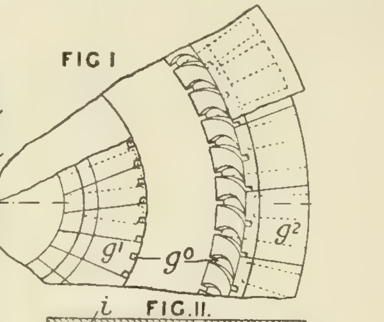
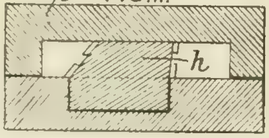


FIG.II.



Institution of Naval Architects.—The dates for the next annual meetings of the Institution have been arranged for March 24th, 1915, and the two following days.

Thomas Hawksley Lecture.—Owing to the sudden death on October 28th of Mr. William B. Bryan, chief engineer of the Metropolitan Water Board, who was to have delivered the lecture on the 30th October, the meeting arranged for that date was cancelled.

Mr. Alfred Booth, one of the best-known figures in shipping and philanthropic circles, passed away on November 2nd. at his home in Sefton Park, Liverpool, at the age of 80. The deceased gentleman, who was of Liverpool birth, was joint founder, with his brother Mr. Charles Booth, of the famous Booth Line of steamers which was inaugurated in 1866.

In June last, Capt. Chas. A. Bartlett, R.D., R.N.R., Marine Superintendent, and Capt. H. J. Haddock, C.B., R.D., R.N.R., were promoted to the active rank of Captain in the R.N.R. These two well-known officers of the White Star Line have recently been given commissions and appointed to command vessels in H.M. Navy. Capt. Haddock until a short time ago commanded the *Oceanic* and latterly the *Olympic*.

Marine Literature.—The firm of G. A. Pratt, of 21 and 22, Oxford Street, Southampton, have issued a catalogue of books in which officers of the mercantile marine will be able to find all the necessary books relating to their profession. The list includes books on Navigation and Nautical Astronomy, Seamanship, Marine Board Examinations, Naval Architecture, Shipping, Marine Engineering, Oil and Gas Engines, Refrigeration, Wireless Telegraphy, etc., etc. There are many other things which this store can supply to the deck or engineer officer and prompt, personal and polite attention will be accorded to all enquiries.

Tests of Decked Lifeboats.—There have recently been subjected to Board of Trade tests in Meadowside Dock, Glasgow, various sizes of McLean's decked lifeboat, Class 2a, which was illustrated and described in our last issue. Including the tests made upon the 30 ft. and the 26 ft. length of boat there have now passed satisfactorily through Board of Trade tests of all kinds, as many as five sizes of the McLean lifeboat. The tests included those concerned with strength, load capacity, draught, freeboard, stability, trim, rowing, with the full complement on board. The 30 ft. size was approved for a load of sixty-six adults, the 28 ft. for 58 adults ; the 26 ft. for 54 adults ; the 25 ft. for 49 adults and the 24 ft. for 44 adults. Embodied in the McLean lifeboat class 2a are found all the features and conditions which the Board of Trade have found it necessary to demand in view of their interpretation of the recommendations made by the International Convention on Safety of Life at Sea. The McLean boats are the first to be designed and passed, having all these points embodied, chiefly because of the large number of orders Messrs. Hugh McLean & Son, Govan, had on hand at the time of the Board of Trade fixing upon their new requirements in boats of the decked-over type. All the trouble and expense of complying with the altered demands have thus devolved on the firm named, and other boat builders who have engaged in the production of decked lifeboats, more or less similar to the McLean design, may to this extent reap the benefit. It is but right that the pioneer work of securing the approval of the Board of Trade for the general type should be credited to Messrs. McLean & Son.

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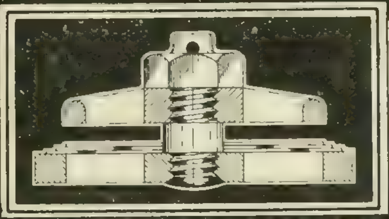

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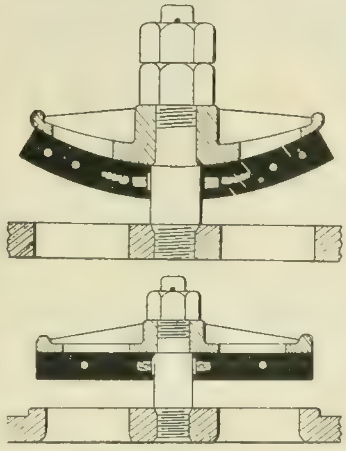

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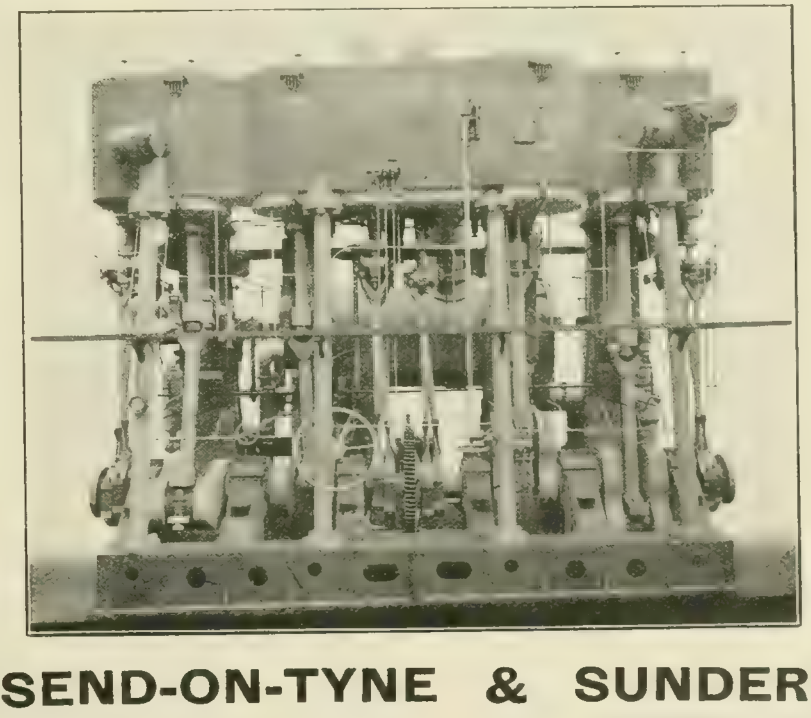

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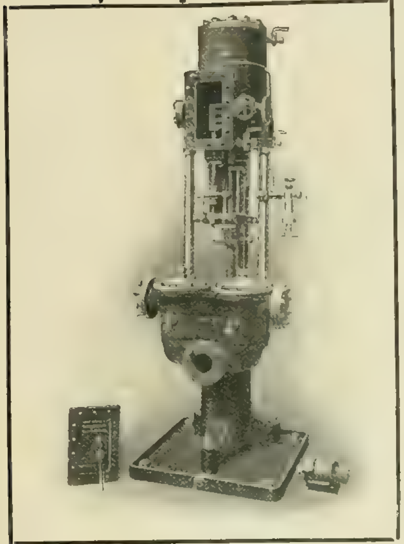

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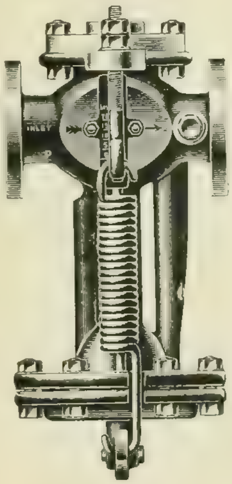

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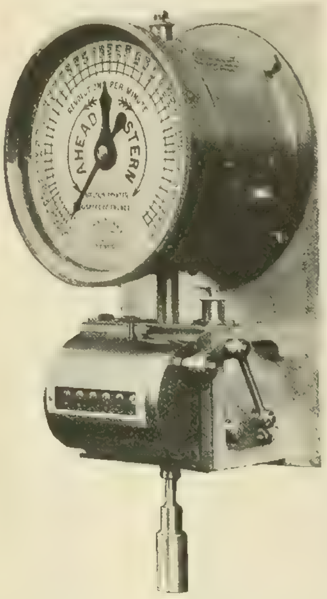

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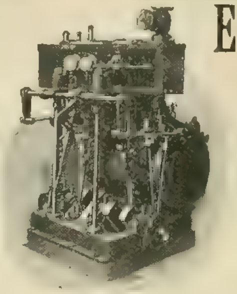

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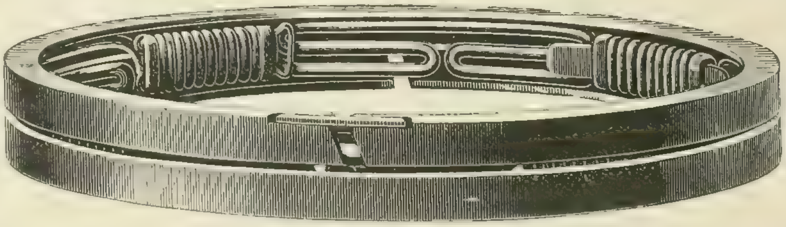

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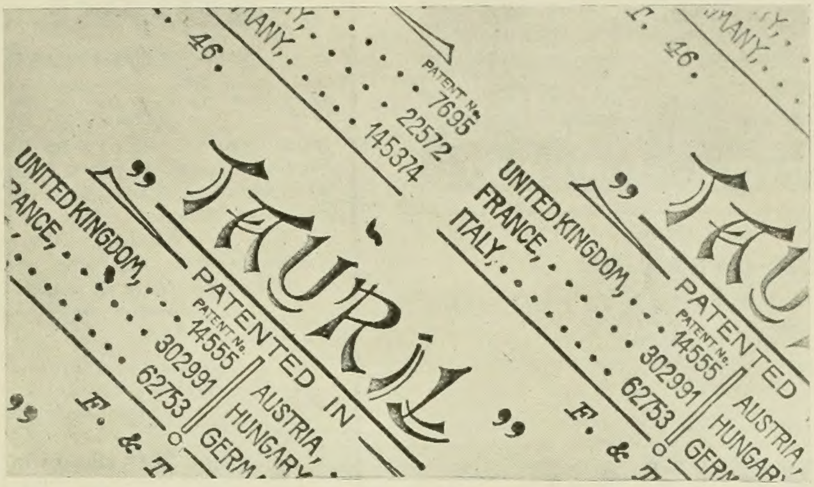

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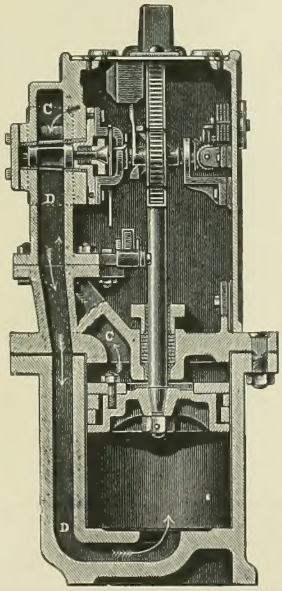

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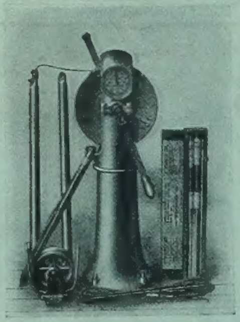

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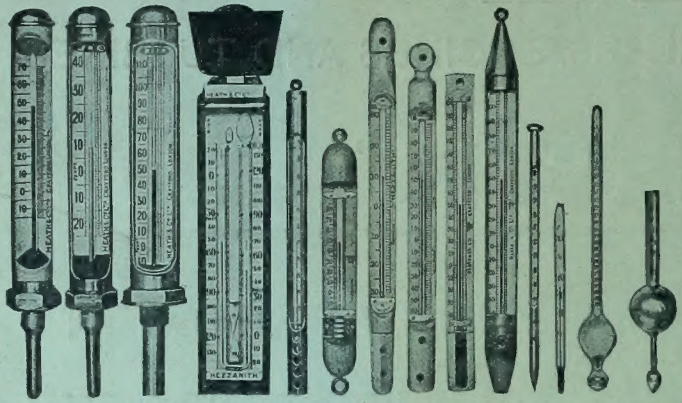

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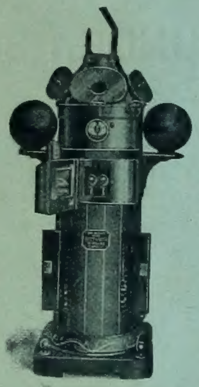

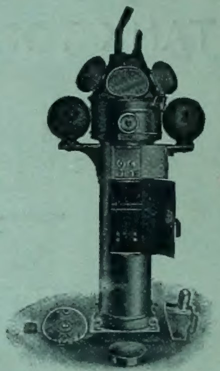

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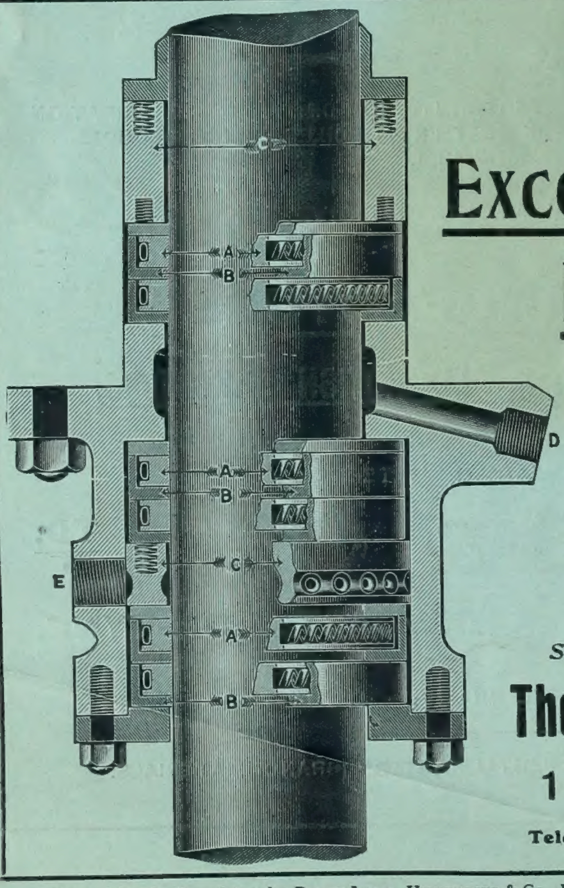

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